Josip Juraj Strossmayer University of Osijek

Faculty of Food Technology Osijek

The Overview
of the study programme of the postgraduate specialist study

Innovations in Food Production

Osijek, 2021.

CONTENTS

1. INTRODUCTION

1.1. General information

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Faculty of Food Technology Osijek

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1.2. Decision on the initiation of the new study programme

The initiation of the procedure for preparation of an Overview of Postgraduate study *Innovations in Food Production* resulted from the Decision of the Council of Faculty of Food Technology Osijek, Class: 003-08/18-06/03, File No: 2158-82-06-18-05, from 29. 3. 2018.

1.3. Staff engaged in the preparation of overview

The Decision of the Council of Faculty of Food Technology Osijek, Class: 003-08/18-06/03, File No: 2158-82-06-18-05, od dana 29. 3. 2018., also named the following Committee for preparation of overview:

Đurđica Ačkar, PhD, associate prof., president

Jurislav Babić, PhD, full prof.

Daniela Čačić Kenjerić, PhD, full prof.

Jovica Hardi, PhD, full prof.

Dragan Kovačević, PhD, full prof.

Borislav Miličević, PhD, full prof.

Ljiljana Primorac, PhD, full prof.

Jasmina Ranilović, PhD, scientific associate, Podravka d. d.

2. INSTITUTIONAL PREREQUISITIES

2.1. Development strategy and action plans for the quality improvement at the Faculty of Food Technology Osijek and reporting on plan implementation

The Development Strategy of the Faculty of Food Technology Osijek (PTFOS) for the period of 2017/2018 - 2021/2022 was adopted at the 4th session of the Faculty Council in academic year 2017/2018, held on January 30th 2018. The Strategy is publicly available (in Croatian) at the web site of PTFOS:

http://www.ptfos.unios.hr/index.php/o-fakultetu/dokumenti.

Each strategic area has defined aims, methods and activities necessary for implementation, and indicators of realization of specific aims and tasks. In the final part of the document, persons and administrative bodies responsible for the implementation, and the timeline are listed.

One of strategic aims of the Faculty is the implementation of new specialist studies based on labour market needs.

Strategic plan of scientific research for period of 2019 – 2023 was adopted at the 10th session of the Faculty Council in academic year 2018/2019, held on July 16th 2019, and is publicly available (in Croatian) at the web site of PTFOS:

http://www.ptfos.unios.hr/index.php/o-fakultetu/sustav-kvalitete.

Reports regarding the realization of the Development Strategy of PTFOS for the previous period (2014 – 2018) and the annual report for academic year 2018/19 and calendar year 2018, and report of the realization of strategic programme of scientific research for previous period (2014 – 2018) are publicly available at the web site:

http://www.ptfos.unios.hr/index.php/izvjesca

2.2. Defining and announcing of standards and regulations for classification of learning outcomes within study programmes of PTFOS

Evaluation of students' activities and grading of students are regulated by the Quality Assuarance Manual (in Croatian) (http://www.ptfos.unios.hr/index.php/dokumenti). It includes: defining rules and criteria for grading students, defining the procedure for lodging a complaint about a given grade, data analysis for number of students enrolled to a senior year of study, analysis of exam performance, monitoring the procedure of selection of the theme, approval and defence of undergraduate and graduate theses, and mobility monitoring.

Learning outcomes and their evaluations are public according to the Quality Assuarnce Manual, and available at Faculty web site for each course. Specific activities, evaluation methods, grading and other specific informations are available for every course. Requirements for teaching activities, continuous monitoring and final exams are defined. This set of information is available on a permanent basis and it is updated pursuant to amendments to a defined implementation plan at the beginning of every academic year.

2.3. Student participation in processes related to quality assurance of PTFOS

Students are in the focus of primary activities of the Faculty (higher education; university undergraduate, graduate and postgraduate studies, scientific research in biotechnology, technical and nature sciences), which is visible through participation of students in the majority of administrative bodies, whenever it is permitted by Faculty and University regulations, and further supported by minutes of the held sessions and meetings, where their presence is confirmed.

According to Statues of Josip Juraj Strossmayer University of Osijek and Faculty of Food Technology Osijek, students are represented in Faculty Councils by their representatives, who count for at least 15% of total number of Council members. Representatives are appointed by the Student Assembly of the Faculty.

The fact that within last 5 years there has not been a Faculty Council session where students issues were not on agenda should be especially stressed.

The Committee for Quality Monitoring and Assurance in Higher Education at the Faculty of Food Technology Osijek, along with teachers, assistants and external members, also includes one student representative, according to Statutes of Josip Juraj Strossmayer University of Osijek and Faculty of Food Technology Osijek, and Ordinance on the Organization of the Higher Education Quality Assurance System at the Faculty of Food Technology Osijek. Student representative is a full member and included in all sessions and decisions of the Committee.

2.4. Participation of representatives of the labour market in development of PTFOS

Industry representatives are members of the Committee for Quality Monitoring and Assurance in Higher Education at the Faculty of Food Technology. The activites of the Committee are defined by the Ordinance on the Organization of the Higher Education Quality Assurance System at the Faculty of Food Technology Osijek.

Furthermore, the Committee for cooperation with the industry, technology transfer and innovations is founded in 2020, with members from the Faculty and industry.

In addition, the Association of former students and friends of the Faculty of Food Technology Osijek (shorted TehnOS), Alumni is founded in 2011 (The Association is registered by Osijek-Baranja County Office on March 25th 2011). The aims of the Alumi are to improve quality of study, scientific and professional research, assisting present students in professional practice and employment.

PTFOS has over 40 bilateral contracts of cooperation with different industries, with defined forms of cooperation, for example:

1. Proposing and working on projects of mutual interests, support in financing projects proposed to national and international organisations,
2. Joint implementation of projects,
3. Organisation of professional (and/or scientific) congresses, seminars and meetings,
4. Education and training of employees,
5. Organisation of field trips of Faculty students to facilities etc.

2.5. Establishment of an IT system intended for collecting, managing, processing and reporting on the statistical data related to the organization and implementation of study programmes and programmes needed for quality assurance

As all other faculties in the Republic of Croatia, Faculty of Food Technology Osijek uses ISVU system to collect, manage, and report statistical data regarding the organisation and implementation of study programmes.

Support Center for ISVU (University Computing Centre (SRCE)) has begun implementing the support for postgraduate studies in ISVU in 2014. In the first phase, acquisition and analysis of current procedures of postgraduate studies is conducted.

Ordinance on students' ID (The Official Gazzette of the Republic of Croatia, Nr 9/14) defines that student ID is a public document proving the student status. Therefore, students of postgraduate studies are allowed to have an ID and may be evidented in the system.

Evidences of students' IDs and statuses are kept in the Ministry of Science and Education in ISAK and ISSP systems, and are used as the central registry of students' statutes by the Ministry, Agency for Science and Higher Education and other regulatory bodies authorised for the use of data.

Statistical analysis of enrolled and graduated postgraduate students (including specialist studies) is conducted based on the Annual plan of statistical activities in the Republic of Croatia, based on the Act on Official Statistic, which obliges insititutions of higher education to send the reports for each academic year to the Croatian Bureau of Statistics.

2.6. Standards and regulations of the institution of higher education regarding the periodic external revision of study programmes

The frequency of revisions of study programmes and their implementations are defined by the Quality Assuarnce Manual, which is publicly available (in Croatian) at:

http://www.ptfos.unios.hr/index.php/dokumenti.

Programmes and qualifications of PTFOS undergo different phases of approval, evaluation and monitoring through formal mechanisms, in both the evaluation of study programmes and amendments of approved study programmes, as regulated by:

- Act on Quality Assurance in Science and Higher Education (O.G. No. 45/09)
- Ordinance on the Content of Licence and Conditions for Issuing Licence for Performing Higher Education Activity, carrying out a Study Programme and Re-accreditation of Higher Education Institutions (OG 24/10),
- Guidelines for the preparation of propositions of study programmes by Agency for science and Higher Education (December 22nd 2010), and
- Ordinance on evaluation of study programmes of University undergraduate, graduate and professional studies of Josip Juraj Strossmayer University of Osijek (June 10th 2009).

2.7. Standards and regulations related to student rights protection, particularly with respect to providing information, receiving and dealing with student complaints and procedures for student rights protection

To substantiate ethical principles and values and to overwiev behaviour, Disciplinary Court for Teachers and assistants, and Disciplinary Court for Students are formed at the Faculty. Their scopes are regulated by the Ordinance on disciplinary responsibilities of teachers and the Ordinance on disciplinary responsibilities of students on University level, available at:

http://www.ptfos.unios.hr/index.php/o-fakultetu/dokumenti.

Ordinance on studies and studying at Josip Juraj Strossmayer University of Osijek and Ordinance on postgraduate studies at Josip Juraj Strossmayer University of Osijek available at:

http://www.ptfos.unios.hr/index.php/o-fakultetu/dokumenti

define organisation and implementation of study, organisation of courses and rules of studying for full-time and part-time students at undergraduate, integrated and graduate studies, and postgraduate studies implemented at the University, as well as quality control.

2.8. Standards and regulations on life-long training of PTFOS employees

PTFOS supports professional development and training of teachers and professional personel in different ways: Pedagogical, Psychological, Didactic and Methodological Training for teachers; according to available funds; PTFOS finances or co-finances participation of employees on seminars, scientific and professional congresses; finances doctoral studies at other universities; supports organisation of scientific and professional conferences; enables use of sabbatical etc.

General standards and rules of training are established by the Act on Scientific Activity and Higher Education, Requirements for Elections to Scientific titles of the National Council for Science and Requirements for Scientific-Educational and Teaching Titles by Rectors' Conference.

International mobility of teaching staff is supported by PTFOS through enabling undisturbed absence, introducing them to institutions with which contracts of cooperation are signed, informing staff about scholarships etc.

Professional staff is also encouraged to training through participation in professional workshops, seminars etc. needed for their work activities.

After completion of education/seminar, employees submit a report on a form to vice-dean for science of PTFOS.

2.9. Quality assurance of secretariat

Professional straff of the Faculty supports the students through Students' office, Library, Informatic Support and other services. The students' opinions, impressions and experiences are collected through procedure described by the Quality Assurance Manual (section 6.2) in order to evaluate the work of non-teaching staff with students. To enable continuous and

planned training, the Strategy of the Faculty includes the planning of training of non-teaching staff.

3. GENERAL PART

3.1. Title of the study

Innovations in Food Production

3.2. Holder of the study

Josip Juraj Strossmayer University of Osijek, Faculty of Food Technology Osijek

3.3. Study type (university or professional)

University

3.4. Level

3 – Postgraduate specialist study

3.5. Scientific area

4. Biotechnical sciences

3.6. Scientfic field

4.05. Food technology

3.7. Scientific branch

4.05.01. Engineering

3.8. Enrolment pre-requisites

Candidates who have graduated master programs in the Republic of Croatia or abroad and plan to work in the field of innovations in food technology may apply for the postgraduate specialist study Innovations in Food Production. For all candidates, after reviewing the courses of graduate studies, the Faculty Council may require additional courses (from graduate level)

necessary for the postgraduate study, based on the recommendation of the Committee of the postgraduate specialist study Innovations in Food Production.

These additional courses have to be finished before the exams of the postgraduate study.

All candidates must have the average mark 3.0 at graduate study (or equivalent mark in other grading systems). The exceptions will be made for students with lower marks if they obtain two recommendation letters by professors who taught at their study program. The final decision about this issue is made by the Faculty Council on the recommendation of the Committee for specialist study.

Foreign students may enroll the postgraduate study Innovations in Food Production under the same conditions as the Croatian students.

3.9. Study duration

Study lasts for two semesters (one academic year). The deadline for study completion is five semesters.

3.10. Total ECTS credit

60 ECTS credits

3.11. Academic title obtained upon study completion

Master degree (degree acquired in undergraduate or graduate study), a specialist in innovations in food production.

3.12. Accredited pre-graduate and graduate studies at PTFOS

The documents of accreditation of study programmes are in the Appendix of the Overview.

Since academic year 2005/06, PTFOS has implemented following pre-graduate and graduate studies in accordance with Bologna process:

- Pre-graduate study Food Technology
- Graduate studies: Food Engineering, Process Engineering, Food Science and Nutrition

According to the IFT (USA, 1964.), food technology is the application of science and engineering in production, processing, packaging, distribution, preparation and consumption of safe and nutritious food.

The programme of pre-diplomatic study Food Technology consists of the array of courses based on the novel scientific knowledge in the field of chemistry, biochemistry and food microbiology, and on engineering knowledge of food production and quality assurance, as well as novel know-how in creation and production of safe and nutritionally valuable food products.

By completing the undergraduate study of Food Technology at the Faculty of Food Technology students acquire sufficient knowledge to continue education at graduate studies (Food Engineering, Process Engineering, Food Science and Nutrition) and sufficient professional knowledge, which enables them to successfully perform all jobs in their profession in food or related industries (enhancement of product quality, process supervision, laboratory work etc.)
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3.13. Harmonization of the study with strategic goals of the institution

The strategic aim “Improvement of the existing and implementation of new study programmes and programmes of life-long education, and continuous improvement of teaching” is defined by the Development Strategy of Faculty of Food Technology for the period 2017/18 – 2021/22. Along with already established postgraduate specialist studies, the proposed postgraduate specialist programme will significantly contribute to the recognition of the Faculty of Food Technology Osijek as a leading higher education institution educating the experts according to the labour market requirements. The aim and the structure of the proposed programme are consistent with strategies of the Faculty and Josip Juraj Strossmayer University of Osijek.

Different study programmes in the field of food technology and nutrition have been implemented at the Faculty of Food Technology Osijek for 50 years and

- 782 university bachelors,
- 1120 graduate engineers,
- 550 masters of engineering,
- 5 masters of science at postgraduate level,
- 60 doctors of science,
- 50 university specialists

have completed some of the programmes.

Today, PTFOS is an institution of higher education with study programmes consistent with similar studies accros the Europe, with successfully implemented Bologna Process. Study programme consistent with Bologna Process has been implemented at the pregraduate study Food Technology since academic year 2005/06, and from academic year 2008/09 at graduate studies Food Engineering, Process Engineering, Food Science and Nutrition. Postgraduate studies encompass postgraduate doctoral study Food Technology and Nutrition, and postgraduate specialist studies Food Safety and Qualty, Technology of Traditional Meat Products and Nutrition. Along with the formal education, PTFOS organises and implements different programmes of life-long learning.

3.14. Competencies acquired by study completion

By the completion of the postgraduate specialist study Innovations in Food Production students will be qualified to organise and lead all phases of a new product development, and improvement of existing portfolio and/or processes in the food industry – from the design of the new product, over its protection to placing on the market, consistent with current legislation and trends.

After the completion of the study students will be able (learning outcomes):

- To comprehensively assess trends in food and related industries;
- To discuss different aspects of the development of new products in the food industry;

- To combine acquired knowledge in the field of development of food products, new processing techniques, industry 4.0, sustainable development and intellectual property with marketing aspects and the influence of innovation on the economy;
- To critically assess the influence of digital environment on consumer behaviour, and food innovations;
- To understand the significance of creation of innovation culture and continuous change in the organization;
- To develop a new food product, taking into a consideration all relevant aspects (chemical and nutritive factors, production, legislation, consumers, environmental and economy aspects);
- To encourage innovation culture in the organisation, create agile teams and to set goals;
- To reformulate existing product and/or adjust the production process to comply with current legislation, dietary guidelines, economical, ethical and environmental aspects;
- To improve the production by replacing traditional processes with novel technologies of thermal and non-thermal processing;
- To apply information technology (modelling, simulation and optimization, cybernetics, cloud technology) in the improvement of the company, existing processes and the development of new products and processes;
- To organise team work in the development of new products;
- To manage the team for the development of new products;
- To present the ideas to colleagues in the field, maketing, management and to investors;
- To critically review recent scientific and professional literature;
- To improve knowledge and know-how according to needs of work position (life-long learning).

3.15. Ensurance of vertical mobility of students in national and international higher education

Student of the postgraduate study Innovations in Food Production may acquire max 5 ECTS credits by enrolling courses in the field of food technology, marketing or application of IT in the food sector at other faculties or universities in Croatia and worldwide. The final decision is made by the Committee of postgraduate study Innovations in Food Production after a review of of credits of the study from which the course is chosen.

3.16. The link of the proposed study to fundamental and contemporary know-how and profession

The proposed study is based on the long experience of Faculty of Food Technology Osijek in education at all three levels of higher education (pregraduate, graduate and postgraduate), scientific research in numerous national and international scientific and professional projects, and co-operation with other scientific insititutions and industry.

The study is consistent with contemporary knowledge and know-how, and the programme includes themes covering development of new products in all branches of food industry, including the current achievements in food technology and nutrition. Competencies for creation and evaluation of new knowledge and development of abstract and creative thinking are distinguished in learning outcomes.

The specific importance is given to development of skills necessary for successful research and the use of knowledge and know-how in the improvement of quality and strengthening of competitiveness, better adjustment to constant fluctuations and complexity of the current working environment. The most important skills integrated in the study curriculum are: team work, communication and presentation, problem solving, organisation, time and risk management, business awareness (understaning the market and prerequisites for succesfull business).

The guarantee of succesfull teaching are teachers/lecturers whose references show that they are active both professionally and scientifically in the fields of food technology, nutrition, intellectual property, economy, entrepreneurship, and fields important for successful development of new products (consumer behaviour, marketing, team management).

3.17. The link of the proposed study to local needs

One of the flagships of the European Strategy 2020 is Innovation Union, which aims to insure transformation of innovative ideas into products and services that create new work places.

Consistently, the Strategy for Innovation Encouragement of Croatia 2014-2020 stresses out that the significance of innovations is not fully recognised in Croatian economy and that the level of innovativeness of Croatian economy is significantly behind European average. According to European Comission results of measurement of innovation performance, the Republic of Croatia is 80th of 140 countries, and innovation is marginalised. World Economy Forum graded Croatia with 61.5 (out of 100) based on the index of global competitiveness 4.0, which includes institutional, legislative and factors determining productivity of the country. This placed Croatia behind Czech Republic (index 70.9), Slovenia (70.2), Poland (68.69), Slovakia (66.8) and Bulgaria (64.9).

Innovation Union is incorportated into the Strategy of City of Osijek.

In addition to lack of innovation policy and low investments into research and development, one of the problems is need for educated personell capable of producing new products and services. Only 2.3% of the population aged between 25 and 64 takes part in life-long learning, showing that Croatian labour population is not well prepared for acceptance of new knowledge and technologies. World Economic Forum states that Croatia takes 128th place (out 141 countries) in employee training, 116th place in quality of formal education and 138th place in critical thinking in education.

All of the above shows that education programmes in the field of innovations are much needed along with strengthening institutional frames and innovation policy. Therefore, Faculty of Food Technology Osijek, having tradition in postgraduate studies, started the implementation of the postgraduate specialist study Innovations in Food Production.

The curriculum of the study is design to expand the knowledge and skills of students in such a way to contribute to development of food companies.

Students who complete the postgraduate specialst study Innovations in Food Production may be employed in R&D of food companies, scientific institutions, Croatian Agency for Agriculture and Food, public health institutes, regional and state agencies for development of programmes in the field of food technology etc.

3.18. Analysis of the employability of students having completed the study programme, including an opinion of three organizations dealing with the labour market on the suitability of expected learning outcomes for labour market needs

Food technology is among the most important industries in the Republic of Croatia. Compared to other processing industries, it makes the most profit and employes the largest number of workers. According to the Agency for Investments and Competitiveness (http://www.aik-invest.hr/sektori/prehrambena-industrija/), over 3000 companies are registered in the production of food and beverages, employing over 58000 people. The proposed study programme aims to fulfil the needs of dynamic labor market and to contribute to strengthening of food sector by strengthening innovation capacities and competitiveness of domestic companies on international market.

The value of the programme has been recognised by Podravka d.d. by taking part in the overview; and by Karolina d.o.o., Karlovac University of Applied Sciences, Society of Chemists and Technologists Osijek which gave the positive opinions.

3.19. Comparison of the proposed university study with relating international accredited programmes of respected higher education institutions, particularly those offered in the EU member states

Abertay University in the United Kingdom has established one-year master (MSc) study Food and Drink Innovation. University of Leeds, Leeds, United Kingdom has implemented master (MSc) study Food Quality and Innovation

Hochschule Fulda, University of Applied Sciences, Fulda, Germany has interdisciplinary pregraduate study Engineering and Management: Food Innovation in the process of accreditation in the field of economy and food technology. van Hall Larensten University of Applied Sciences, Velp, Holland has implemented pregraduate study Food Innovation Management in the field of food technology.

University of Melbourne, Melbourne, Australia has implemented study Master of Food and Packaging Innovation.

According to applicant's knowledge, there is no established postgraduate specialist studies in this area in EU countries.

3.20. Previous experience of the proposing body in organizing the same or relating university studies

Engineers of food technology have been educated at the Faculty of Food Technology for the past 40 years (since 1976), masters of science (study Food Engineering) from 1997 and doctors of science (studies: Food Engineering, and Food Technology and Nutrition) from 2002.

Today, PTFOS has study programmes harmonised with studies in Europe and successfully implemented Bologna Process. Postgraduate profiling is established through doctoral study Food Technology and Nutrition, and specialist studies Food Safety and Quality, Technologies of Traditional Meat Products, and Nutrition. Along with formal education, Faculty implements different life-long learning programmes.

3.21. Partners beyond higher education system involved in the study implementation

Podravka d.d. (Contract)

State Intellectual Property Office (Contract)

3.22. International cooperation of PTFOS

Faculty of Food Technology Osijek has established extensive cooperation with scientific institutions in the country and abroad. The international collaboration is mostly realized through international projects, memberships in international associations, CEEPUS and Erasmus mobility programmes.

Faculty of Food Technology Osijek is the member of the following international organisations:

- *International Association for Cereal Science and Technology (ICC)*.
- *The International Honey Commission (IHC)*.
- *ISEKI Food Asociation (IFA)*
- *European Hygienic Engineering & Design Group (EHEDG)*

Within last five years PTFOS has organised or co-organised following international conferences:

- International Scientific-Professional Congress Food Industry by-Products in collaboration with EHEDG (2020.)
- „Ružička days“ (2014., 2016., 2018., 2020.). On the Faculty initiative, in 2010 the Congress becomes international through collaboration with EFFOST, and since 2012 EuCheMS,
- Conference “Flour – Beread” (2015., 2017., 2019.) with ICC,
- „Water for all“, international since 2015,
- Co-organizer of 48th Croatian and 8th International Symposium of Agronomists .
- Co-organizer of Congress on beekeeping and bee products, international since 2020
- Co-organiser of the Conference “With Food to Health”, international since 2015.

In 2008, Scientific-Professional Journal *Croatian Journal of Food Science* was established, with the first number published in 2009. It is published twice a year, and indexed in CAB Abstracts, FSTA (Food Science and Technology Abstract), EBSCO Publishing, Inc., HRČAK, Directory of Research Journals Indexing, Google Scholar, OpenAIRE, Genamics JournalSeek, Base, Science Library Indeks, Cite Factor, DOAJ, International Innovative Journal Impact Factor (IIJIF), J-Gate.

Over 85 reviewers from EU, USA, Asia, South America and regional countries are on the list of permanent reviewers.

PTFOS is co-publisher of Journal for Nutrition and Dietetics *Food in Health and Disease* with Faculty of Pharmacy Tuzla. The first edition was in April 2012 in Tuzla, and the Journal is indexed in: CAB Abstracts, FSTA (Food Science and Technology Abstract), HRČAK.

PTFOS supports the mobility of teaching and non-teaching staff via different networks (CEEPUS, ERASMUS, etc.). Mobility and cooperation are established through bilateral agreements on cooperation with institutions in neighboring countries:

- Faculty of Technology, Novi Sad, Serbia
- Faculty of Agronomy and Food Technology, Mostar, B&H
- Faculty of Chemistry and Chemical Engineering, Maribor, Slovenia
- Faculty of Agriculture and Food Sciences, Sarajevo, B&H
- Faculty of Biotechnical Sciences, Bitola, North Macedonia
- Faculty of Chemistry, Belgrade, Serbia

Recently, PTFOS has participated in international projects with following foreign higher education institutions:

- Universidad de Lleida, Spain,
- BOKU University, Austria,
- Glasgow Caledonian University, Glasgow, Scotland,
- Aristotle University of Thessaloniki, Greece,
- Technological Educational Institute of Western Macedonia, Greece,
- University of Food Technologies, Plovdiv, Bulgaria,
- University of Economics - Varna, Bulgaria,
- University St. Kliment Ohridski - Bitola, North Macedonia,
- University St. Cyryl Methodius, Skopje, North Macedonia,
- University of Belgrade, Serbia,
- University of Novi Sad, Serbia,
- Tessedik Samuel College, Hungary,
- Politehnica University of Timisoara, Romania,
- Agora University, Rumunjska,
- Telford College of Arts and Technology, Great Britain,
- Southwest University, China,
- Corvinus University of Budapest, Hungary,
- University of Udine, Italy,
- University of Montenegro, Faculty of Medicine, Montenegro,
- University of Ljubljana, Biotechnical Faculty, Slovenia,
- University of Maribor, Faculty of Chemistry and Chemical Engineering, Slovenia.

3.23. Regulated professions – the mode setting forth harmonization with the minimum training requirements prescribed in the Directive 2005/36/EC of the European Parliament and of the Council of 7 September 2005 on the recognition of professional qualifications and the Act on Regulated Professions and the Recognition of Foreign Professional Qualifications

There are no regulated professions in the database.

4. DESCRIPTION OF THE CURRICULUM

The postgraduate specialist study is organised as a one-year study (2 semesters).

It includes:

- Teaching actitivites and
- Registration and defence of specialist thesis (20 ECTS credits)

Courses are:

- Compulsory and
- Elective.

Curricular activities at the postgraduate specialist study Innovations in Food Production include lecture, seminars and practices and may be implemented as teaching in classroom or in hybrid form (e-learning combined with laboratory practice) and last for two semesters. Mentor assists the student in selection of courses and guides the student throughout the study.

There are no pre-requisites for selection of courses, unless courses from under- or graduate level must be taken.

4.1. The list of compulsory (O) and elective (I) courses

Code	Course title	Course holder	L	P	S	ECTS	Status
PSS-I-01o	**Introduction to Innovations in Food Production**	Đurđica Ačkar, PhD, assoc. prof.	15	0	15	5	O
PSS-I-02o	**Intellectual Property**	Dragan Kovačević, PhD, full prof.	20	5	5	5	O
PSS-I-03o	**Innovations and Economic Development**	Dragan Kovačević,PhD, full prof.	30	0	0	5	O
PSS-I-04	**Challenges of Innovation in Digital Time and Examples from Practice**	dr. sc. Jasmina Ranilović, PhD, scientific advisor	10	0	15	4	I
PSS-I-05	**Market Research and Marketing Strategies**	Marija Ham, PhD, full prof.	16	0	4	3	I
PSS-I-06	**Food Chemistry**	Mirela Kopjar, PhD, full prof.	20	0	5	4	I
PSS-I-07	**Selected Topics in Food Quality and Safety**	Ljiljana Primorac, PhD, full prof.	15	0	5	3	I
PSS-I-08	**Nutritional Aspects of New Food Product Development**	Daniela Čačić Kenjerić, PhD, full prof.	10	0	10	3	I
PSS-I-09	**Optimization in the Development and Production of Food Products**	Stela Jokić, PhD, full prof.	10	5	10	4	I
PSS-I-10	**Fourth Industrial Revolution and Food Production**	Frane Čačić Kenjerić, PhD, assoc. prof.	20	0	5	4	I
PSS-I-11	**Sustainable Food Production**	Natalija Velić, PhD, assoc. prof.	10	0	10	3	I
PSS-I-12	**Development and Design of Packaging for a New Product**	Lidija Jakobek Barron, PhD, full prof.	15	0	5	3	I
PSS-I-13	**Innovative Food Processing Techniques**	Drago Šubarić, PhD, full prof.	15	2	3	3	I
PSS-I-14	**Sensory Characterisation of New Product**	Ivana Flanjak, PhD, assoc. prof.	15	0	5	3	I
PSS-I-15	**Consumer Behavior in the Digital Environment**	Ivan Kelić, PhD, assist. prof.	15	0	10	4	I
PSS-I-16	**Managing Creativity Processes**	Sanja Pfeifer, PhD, full prof.	15	0	5	3	I
PSS-I-17	**Digital Marketing and Marketing Communication**	Antun Biloš, PhD, assoc. prof.	20	0	0	3	I
PSS-I-18	**New Venture Creation (from Idea to Realisation)**	Sunčica Oberman Peterka, PhD, full prof.	20	0	10	5	I
PSS-I-19	**Project Management and Team Work**	Aleksandar Erceg, PhD, assoc. prof.	15	0	10	4	I

4.1.1. Courses

Compulsory courses

General information		
Course holder	Đurđica Ačkar, PhD, Assoc. Prof.	
Course title	**Introduction to Innovations in Food Production (PSS-I-01o)**	
Study programme	**PSS Innovations in Food Production**	
Course status	compulsory	
Year of study	1	
Credits and Teaching Method (number of classes)	ECTS	5
	Number of classes (L+E+S)	30 (15+0+15)

1. COURSE DESCRIPTION		
1.1. Course aims		
To introduce the students to innovation strategies, key (internal and external) factors in succesful product development, process of the development and the role of consumers in the product development.		
1.2. Prerequisites for enrolment		
-		
1.3. Learning outcomes at the course level		
After completion of the course students will be able: 1. To identify and analyse trends in the food industry. 2. To recognise challengies and opportunities for innovations in food industry. 3. To design a new product, taking into consideration all aspects from the environment to internal factors of the product. 4. To improve existing products and processes. 5. To understand the roles of team leader, team members and consumers in the product development.		
1.4. Course content		
Definition of innovation and new product. Factors influencing the product – environment, society, industrial level, level of the product/process. Phases of development of innovation and new product – idea, conceptualisation, feasibility study, development phase, placing the product on the market. Challenges and obstacles in product development. Trends and their influence on innovations. Partners in development of new products. Role of consumers in development of new products. Management of nnew product development. Improvement od products and processes.		
1.5. Class-related activities	☒ lectures ☒ seminars and workshops ☐ exercizes ☒ distance learning ☐ field work	☐ individual tasks ☐ multimedia and network ☐ laboratory ☐ mentored activity ☐ other _____
1.6. Commentaries		

1.7. Students' obligations

1.8. Monitoring the activitiy of students

Class attendance	0.25	Class activities	0.25	Seminary work	2.25	Experimental work	
Written exam		Oral exam	2.0	Essay		Research	
Project		Continuous knowledge check		Report		Practical work	
Portfolio							

1.1. Grading of students during classes and at the final exam

Attendance record, activity at class, grading seminary work and oral exam

1.2. Mandatory literature

Galanakis CM: Innovation Strategies in the Food Industry Tools for Implementation. Academic Press, 2016.
Moskowitz HRI, Saguy S, Strauss T: An Integrated Approach to New Food Product Development, CRC Press, 2009.
Earle M, Earle R, Anderson A: Food Product Development, CRC Press, 2001
Fuller GW: New Food Product Development: From Concept to Marketplace, 3rd Ed. CRC Press, 2011.
Vyas V: Low-Cost, Low-Tech Innovation: New Product Development in the Food Industry, 1st Ed., Routledge, 2014.

1.3. Additional literature

Crowson R: Product Design and Factory Development 1st Ed., CRC Press, 2005.
Krešić G: Trendovi u prehrani, Fakultet za menadžment u turizmu i ugostiteljstvu, Opatija, 2012.
Smith J, Charter E: Functional Food Product Development, Blackwell Publishing Ltd, 2010.
Harmsen J, de Haan AB, Swinkels PLJ: Product and Process Design Driving Innovation, De Gruyter, Berlin/Boston, 2018.
Scientific and professional articles

1.4. Number of copies of mandatory literature available in the library and via other media

Title	*Number of copies*	*Number of students*
Krešić G: Trendovi u prehrani	10	

1.5. Quality assurance procedures designed to ensure the acquisition of outcomes and competencies

Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Food Technology Osijek
Course teacher may use other surveys for quality monitoring.

General information		
Course holder	Dragan Kovačević, PhD, Full Prof.; Tanja Milović, MSc	
Course title	**Intellectual Property (PSS-I-02-o)**	
Study programme	**PSS Innovations in Food Production**	
Course status	compulsory	
Year of study	1	
Credits and Teaching Method (number of classes)	ECTS	5
	Number of classes (L+E+S)	30 (20-0-10)

1. COURSE DESCRIPTION		
1.9. Course aims		
The course is designed to provide knowledge on intellectual property as intangible (non-material) asset used for achieving global competitiveness of technological innovations based on the results of scientific research, as well as to provide knowledge on the role of protection of intellectual property in supporting creativity, innovations, and economic development in general. In addition, the course is intended to provide knowledge on various intellectual property aspects with specific emphasis on industrial property, particularly geographical indications and designations of origin, patents as rights granted for an invention that offers a solution to a technical problem, using new or enhanced process, product, or use. Students will be introduced to the protection of intellectual property rights procedure as well as to various institutions at global and national level, in charge for intellectual property and its protection.		
1.10. Prerequisites for enrolment		
-		
1.11. Learning outcomes at the course level		
Upon completion of the course students will be able to: 1. Distinguish and describe the types of intellectual property 2. Distinguish the terms: idea, invention, innovation, patent, know-how, trademark, copyright, industrial design, trade secrets 3. Identify and initiate procedure for patent protection of their own innovative (new or improved) products, processes, or implementation of production process 4. Analyse intellectual property databases as to assess the possibility of protection their own inventions 5. Manage their own inventions and intellectual property and to implement it in business 6. Analyse and propose modality for food protection by designations of origin or geographical indications 7. Prepare the application for protection of industrial property		
1.12. Course content		
Definition of intellectual property. Intellectual property division on copyrights and related rights and industrial property rights (patents and utility models, trademarks, industrial design, geographical indications and designations of origin, topography of semiconductor product). Conceptual definition of the idea, invention, technological innovation, patent, know-how, inventor, innovator. State Intellectual Property Office and other european and world institutions in charge of intellectual property. Acquisition of intellectual property rights procedure. Legal protection of intellectual property in the Republic of Croatia and in the European Union. Trade secret. The role of intellectual property in promoting the innovation and economic development.		
1.13. Class-related activities	☒ lectures ☒ seminars and workshops ☒ exercises ☒ distance learning ☐ field work	☒ individual tasks ☐ multimedia and network ☐ laboratory ☒ mentored activity ☐ other _____

1.14. Commentaries	

1.15. Students' obligations

Attending lectures, participating in distance learning, writing a seminar paper and oral exam.

1.16. Monitoring the activity of students

Class attendance	0,5	Class activities	0,5	Seminary work	2,0	Experimental work	
Written exam		Oral exam	2,0	Essay		Research	
Project		Continuous knowledge check		Report		Practical work	
Portfolio							

1.17. Grading of students during classes and at the final exam

Lectures and practical work attendance, class activities, seminar paper evaluation, oral exam evaluation.

1.18. Mandatory literature

Van Norman, GA, Eisenkot, R (2017): Technology Transfer: From the Research Bench to Commercialization: Part 1: Intellectual Property Rights-Basics of Patents and Copyrights. JACC: Basic to Translational Science. 2 (1) 85-97. https://www.sciencedirect.com/science/article/pii/S2452302X17300037
World Intellectual Property Organization (2017): Geographical Indications An Introduction. https://www.wipo.int/edocs/pubdocs/en/geographical/952/wipo_pub_952.pdf
World Intellectual Property Organization (2019): Looking Good: An Introduction to Industrial Designs for Small and Medium-sized Enterprises. https://www.wipo.int/edocs/pubdocs/en/wipo_pub_498_1.pdf
World Intellectual Property Organization (2018): Inventing the Future An Introduction to Patents for Small and Medium-sized Enterprises. https://www.wipo.int/edocs/pubdocs/en/wipo_pub_917_1.pdf

1.19. Additional literature

D. Kovačević (2017.): Inovacije kao temelj konkurentnosti hrvatske prehrambene industrije. Rad Hrvatske akademije znanosti i umjetnosti. Tehničke znanosti. 531 (18) 49-76.
World Intellectual Property Organization (2017): Making a Mark An Introduction to Trademarks for Small and Medium-sized Enterprises. https://www.wipo.int/edocs/pubdocs/en/wipo_pub_900_1.pdf.

1.20. Number of copies of mandatory literature available in the library and via other media

Title	*Number of copies*	*Number of students*
Van Norman, GA, Eisenkot, R (2017): Technology Transfer: From the Research Bench to Commercialization: Part 1: Intellectual Property Rights-Basics of Patents and Copyrights. JACC: Basic to Translational Science. 2 (1) 85-97.	available online	
World Intellectual Property Organization (2017): Geographical Indications An Introduction	available online	
World Intellectual Property Organization (2019): Looking Good: An Introduction to Industrial Designs for Small and Medium-sized Enterprises	available online	
World Intellectual Property Organization (2018): Inventing the Future An Introduction to Patents for Small and Medium-sized Enterprises.	available online	

D. Kovačević (2017.): Inovacije kao temelj konkurentnosti hrvatske prehrambene industrije. Rad Hrvatske akademije znanosti i umjetnosti. Tehničke znanosti. 531 (18) 49-76.	available online	
World Intellectual Property Organization (2017): Making a Mark An Introduction to Trademarks for Small and Medium-sized Enterprises.	available online	
1.21. Quality assurance procedures designed to ensure the acquisition of outcomes and competencies		
Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Food Technology Osijek Course teacher may use other surveys for quality monitoring.		

General information		
Course holder	Dragan Kovačević, PhD, Full Prof.	
Course title	**Innovations and Economic Development (PSS-I-03o)**	
Study programme	**PSS Innovations in Food Production**	
Course status	compulsory	
Year of study	1	
Credits and Teaching Method (number of classes)	ECTS	5
	Number of classes (L+E+S)	30 (30+0+0)

1. COURSE DESCRIPTION		
1.22. Course aims		
The course is designed to provide knowledge on the role of intellectual capital, research, and innovations in enterprise productivity as well as in competitiveness and economic development. In addition, the course is intended to provide understanding of knowledge, intellectual capital, research and innovations as economic resources and of their role in so-called new knowledge economy. Students will be introduced to european and national research and innovation systems, innovation performance indicators (Summary Innovation Index, SII) as well as to the role of public and private sector in creation of positive regulatory and financial framework needed for supporting research and innovations. Students will be introduced to global innovation trends in food production as well as to trends and innovation efficiency of Croatian food industry.		
1.23. Prerequisites for enrolment		
-		
1.24. Learning outcomes at the course level		
Upon completion of the course students will be able to: 1. Define and compare terms - knowledge, intellectual capital, innovations, and explain their role in enterprise productivity, competitiveness, and economic development 2. Analyse impact of digitization that is development of information and communications technologies, and industry 4.0 on innovativeness, productivity, and competitiveness 3. Analyse specific innovation performance indicators 4. Consider european and national research and innovation systems 5. Analyse and discuss the role of public and private sector in in creation of positive regulatory and financial framework needed for supporting research and innovations 6. Assess the innovation efficiency of Croatian food industry 7. Specify and describe global innovation trends in food production.		
1.25. Course content		
The function of intellectual capital, research and development, digitization and innovations in enterprise productivity as well as in competitiveness and economic development. The EU innovation policy and the concepts of European Research Area (ERA) and Innovation Union. Public and private sector expenditure on research and development (Gross Domestic expenditure on R&D), countries ranking by innovation performance indicators (Summary Innovation Index). Definition and classification of innovations according to the OECD methodology – technological (product and process innovation) and non-technological (marketing and organisational innovation). Global innovation trends in food production. Innovativeness and competitiveness of Croatian food industry.		
1.26. Class-related activities	☒ lectures ☐ seminars and workshops ☐ exercises	☐ individual tasks ☐ multimedia and network ☐ laboratory ☐ mentored activity

						☒ distance learning ☐ field work	☐ other _____
1.27. Commentaries							
1.28. Students' obligations							
Active participation in classes, writing a seminar paper and oral exam.							
1.29. Monitoring the activity of students							
Class attendance	0,5	Class activities	0,5	Seminary work	2,0	Experimental work	
Written exam		Oral exam	2,0	Essay		Research	
Project		Continuous knowledge check		Report		Practical work	
Portfolio							
1.30. Grading of students during classes and at the final exam							
Lectures attendance, class activities, seminar paper evaluation, oral exam evaluation.							
1.31. Mandatory literature							
Kovačević D (2017.): Inovacije kao temelj konkurentnosti hrvatske prehrambene industrije. Rad Hrvatske akademije znanosti i umjetnosti. Tehničke znanosti. 531 (18) 49-76. Šokčević, S., Šlogar, H., Rudančić, A. (2018.): Značaj inovacija i konkurentnosti za gospodarski rast i razvoj hrvatskog gospodarstva. 7.PAR International Leadership Conference (PILC). Nikolić, G. (ur.). Rijeka: Visoka poslovna škola PAR, 2018. str. 207-229. Europska komisija (2014.): Obzor 2020. Okvirni program EU-a za istraživanje i inovacije. Luxembourg: Ured za publikacije Europske unije. European Commission (2020): European Innovation Scoreboard 2020. Luxembourg: Publications Office of the European Union. FoodDrinkEurope (2019): European Food And Drink Industry, Data & Trands 2019.							
1.32. Additional literature							
Kotler, P., Keller, K.L. and Martinović, M. (2014). Upravljanje marketingom, XIV izdanje. Zagreb: Mate d.o.o., Zagreb. Kolaković , M. (2010.): Virtualna ekonomija. Strategija d.o.o. Zagreb. Zagreb.							
1.33. Number of copies of mandatory literature available in the library and via other media							

Title	*Number of copies*	*Number of students*
Kovačević D (2017.): Inovacije kao temelj konkurentnosti hrvatske prehrambene industrije. Rad Hrvatske akademije znanosti i umjetnosti. Tehničke znanosti. 531 (18) 49-76.	available online	
Šokčević, S., Šlogar, H., Rudančić, A. (2018.): Značaj inovacija i konkurentnosti za gospodarski rast i razvoj hrvatskog gospodarstva. 7.PAR International Leadership Conference (PILC). Nikolić, G. (ur.). Rijeka: Visoka poslovna škola PAR, 2018. str. 207-229.	available online	

Europska komisija (2014.): Obzor 2020. Okvirni program EU-a za istraživanje i inovacije. Luxembourg: Ured za publikacije Europske unije.	available online	
European Commission (2020): European Innovation Scoreboard 2020. Luxembourg: Publications Office of the European Union.	available online	
FoodDrinkEurope (2019): European Food And Drink Industry, Data & Trands 2019.	available online	
Kotler, P., Keller, K.L. and Martinović, M. (2014). Upravljanje marketingom, XIV izdanje. Zagreb: Mate d.o.o., Zagreb.	available online	
Kolaković , M. (2010.): Virtualna ekonomija. Strategija d.o.o. Zagreb. Zagreb.	available online	
1.34. Quality assurance procedures designed to ensure the acquisition of outcomes and competencies		
Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Food Technology Osijek Course teacher may use other surveys for quality monitoring.		

Elective courses

General information		
Course holder	Jasmina Ranilovic, PhD, Scientific Associate	
Course title	**Challenges of Innovation in Digital Time and Examples from Practice (PSS-I-04)**	
Study programme	**PSS Innovations in Food Production**	
Course status	Elective	
Year of study	1	
Credit and teaching methods (number of classes)	ECTS	4
	Number of classes (L+E+S)	10+0+15

1. COURSE DESCRIPTION		
1.1. Course aims		
Introduce the students to: advantages and misconceptions of digitalization in the context of industry 4.0, the meaning of added value in theory and practice - examples from food companies, the new role of consumers. Students are introduced with importance of long-term establishment of organizational culture that encourage innovation in the company and with development of innovative products / services as a prerequisite for strengthening the competitiveness of the company / economy.		
1.2. Prerequisites for enrolment		
-		
1.3. Learning outcoms at the course level		
After completing the course, students will be able to: 1. Analyze digitalization and its advantages (risks) 2. Define the meaning of the terms Industry 4.0, Internet of Things, Gemification 3. Link stakeholders in value creation process in digital time 4. Distinguish the differences between closed and open model of innovation in organizations 5. Assess the return on investment and risks (eg Covid-19 impact) 6. Apply tools to evaluate ideas in food product development and analysis, through case studies		
1.4. Course content		
The following chapters will be covered through case studies: Industry 4.0, the Internet of Things, Gemification, a networked society as new opportunities in innovation in food production (traditionally a "slow" industry in terms of adapting to change). Changing the paradigm of the enterprise → consumer relationship, from the traditional, "company-centric", one-way relationship, to a two-way, collaborative (enterprise-consumer) relationship, because the consumer has become "networked". Preparing a supportive organizational environment in the company and managing innovation and measuring performance indicators. Good market analysis in the product development phase, but also continuous monitoring of post-purchase consumer behavior as measures that ensure longer success of products / services in the market.		
1.5. Class related activities	☒ lectures ☒ seminars and workshops ☐ exercizes ☐ distance learning ☐ field work	☐ individual tasks ☐ multimedia and network ☐ laboratory ☐ mentored activity ☐ other _____

1.6. Commentaries							
1.7. Students' obligations							
To attend classes and write seminary work.							
1.8. Monitoring the activity of students							
Class attendance	0,5	Activity at classes		Seminary work	3,5	Experimental work	
Written exam		Oral exam		Essay		Research	
Project		Continuous knowledge check		Report		Practical work	
Portfolio							

1.6. Grading of students during classes and at the final exam

1.7. Mandatory literature

- Ranilović, J. (2018). Izazovi stvaranja vrijednosti za dionike prehrambene industrije, 11. međunarodni znanstveno-stručni skup ''Hranom do zdravlja'', Prehrambeno-tehnološki fakultet Osijek; Split, 18.-19. listopada 2018., plenarno izlaganje
- Tucci, C., Chesbrough, H., Piller, F., West.,J. (2017). Open Innovation and Open Business Models: When do firms undertake open, collaborative activities? Industrial & Coprorate Change, 25,2.
- Chesbrough, H. and Bogers, M. (2014) 'Explicating open innovation: Clarifying an emerging paradigm for understanding innovation' in H. Chesbrough, W. Vanhaverbeke and J. West(Eds.), New Frontiers in open Innovation, Oxford: Oxford University Press, pp. 3-28.
- Matzler, K., Bailom, F. Friedrich von den Eichen, S., Kohler, T. (2013). Business model innovation: coffee triumphs for Nespresso. Journal of Business Strategy, Vo. 34 (2), pp.30-37.

1.8. Additional literature

- Berchicci, L. (2013). Towards an open R&D system: Internal R&D investment, external knowledge acquisition and innovative performance. Research Policy, 117-127.
- Prahalad, C.K., Ramaswamy, V. (2004). Co-creation experiences: the next practice in value creation. Journal of interactive marketing. 18,3.

1.9. Number of copies of mandatory literature available in the library and via other media

Title	*Number of copies*	*Number of students*

1.10. Quality assurance procedures designed to ensure the acquisition of outcomes and competencies

Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Food Technology Osijek
Course teacher may use other surveys for quality monitoring.

General information		
Course holder	Marija Ham, PhD, Full Prof.	
Course title	**Market Research and Marketing Strategies (PSS-I-05)**	
Study programme	**PSS Innovations in Food Production**	
Course status	Elective	
Year of study	1	
Credits and Teaching Method (number of classes)	ECTS	3
	Number of classes (L+E+S)	**20 (16 + 0 + 4)**

1. COURSE DESCRIPTION

1.1. Course aims

The aim of the course is to acquaint students with the methods and tools of market research and the process of creating optimal marketing strategies for achieving and maintaining a competitive advantage in the market.

1.2. Prerequisites for enrolment

-

1.3. Learning outcomes at the course level

After successfully mastering the course, postgraduates will be able to:
1. Interpret the importance of marketing and market research applications
2. Describe individual methods and techniques of market research
3. Distinguish and describe individual marketing strategies
4. Select and apply appropriate market research methods
5. Select and argue the reasons for choosing the marketing strategy of a particular company

1.4. Course content

Basics of marketing. Marketing research. The concept, goal and purpose of market research. Marketing information. Marketing decision making. Market research process. Types of research. Data sources. Market research methods. Application of the sample in market research. Application of market research. Concepts of marketing strategy and strategic decision making. Choice between alternative strategies. Evaluation strategies. Implementation and control of marketing strategy.

1.5. Class-related activities	☒ lectures ☒ seminars and workshops ☐ excersizes ☐ distance learning ☐ field work	☒ individual tasks ☒ multimedia and network ☐ laboratory ☒ mentored activity ☐ other _____
1.6. Commentaries		

1.7. Students' obligations

Students are required to actively participate in classes and prepare a seminar paper.

1.8. Monitoring the activitiy of students

Class attendance	0,5	Class activities	0,5	Seminary work	1	Experimental work	
Written exam		Oral exam	1	Essay		Research	
Project		Continuous knowledge check		Report		Practical work	
Portfolio							

1.11. Grading of students during classes and at the final exam

Evaluation of student work will be done through:
Project and research presented in seminar paper (50%), practical work (30%), oral exam (20%)

1.12. Mandatory literature

Meler, M.: Istraživanje tržišta, Ekonomski fakultet u Osijeku, Osijek 2005.
Renko, N.: Strategije marketinga, Naklada "Ljevak", Zagreb 2005. ili 2009.

1.13. Additional literature

Marušić, M., Vranešević, T.: Istraživanje tržišta, 5. izdanje, ADECO, Zagreb 2001.
Kotler, Ph., Wong, V., Saunders, J., Armstrong, G.: Osnove marketinga, četvrto europsko izdanje, MATE, Zagreb 2006.

1.14. Number of copies of mandatory literature available in the library and via other media

Title	*Number of copies*	*Number of students*
Meler, M.: Istraživanje tržišta, Ekonomski fakultet u Osijeku, Osijek 2005.	5 (GISKO)	
Renko, N.: Strategije marketinga, Naklada "Ljevak", Zagreb, 2009.	3 (GISKO)	

1.15. Quality assurance procedures designed to ensure the acquisition of outcomes and competencies

Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Food Technology Osijek
Course teacher may use other surveys for quality monitoring.

General information		
Course holder	Mirela Kopjar, PhD, Full Prof.	
Course title	**Food Chemistry (PSS-I-06)**	
Study programme	**PSS Innovations in Food Production**	
Course status	elective	
Year of study	1	
Credits and Teaching Method (number of classes)	ECTS	4
	Number of classes (L+E+S)	25 (20+0+5)

1. COURSE DESCRIPTION		
1.1. Course aims		
Introducing students with chemical composition of food and functional properties of food components. Also, students will get knowledge on possible interactions between components depending on conditions during processing and storage.		
1.2. Prerequisites for enrolment		
-		
1.3. Learning outcomes at the course level		
After the course students will be able to: 1. define and analyse food components 2. define and explain functional properties of food components 3. explain interactions between food components 4. predict influence of interactions on food quality and stability during processing and storage		
1.4. Course content		
Chemical composition of food products. Functional properties of food components. Interactions between food components and their influence on food quality (sensory properties, food safety and nutritional value). Influence of processing parameters on interactions between food components. Interactions between food components during storage. Formulation of food products. Replacement of some components and its consequences. Preparation of seminary work.		
1.5. Class-related activities	☒ lectures ☒ seminars and workshops ☐ exercizes ☐ distance learning ☐ field work	☐ individual tasks ☐ multimedia and network ☐ laboratory ☐ mentored activity ☐ other _____
1.6. Commentaries		
1.7. Students' obligations		
Participation on classes (or learning on distance), preparation of seminary work and passing oral exam.		
1.8. Monitoring the activitiy of students		

Class attendance	1	Class activities		Seminary work	1	Experimental work	

Written exam		Oral exam	2	Essay		Research	
Project		Continuous knowledge check		Report		Practical work	
Portfolio							

1.16. Grading of students during classes and at the final exam

Student will be graded through participation on classes, preparation of seminary work and final (oral) exam.

1.17. Mandatory literature

H.D. Belitz, W. Grosch, P. Schieberle: Food Chemistry. Springer, 4th revised and extended ed., 2009.
S. Damodaran, K.L. Parkin, O.R. Fennema: Fennema`s Food Chemistry. CRC Press, 2008.

1.18. Additional literature

B.K. Simpson: Food Biochemistry and Food Processing. Wiley-Blackwell, 2012.

Z.E. Sikorski: Chemical and Functional Properties of Food Components. CRC Press, 2002.

1.19. Number of copies of mandatory literature available in the library and via other media

Title	*Number of copies*	*Number of students*

1.20. Quality assurance procedures designed to ensure the acquisition of outcomes and competencies

Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Food Technology Osijek
Course teacher may use other surveys for quality monitoring.

General information		
Course holder	Ljiljana Primorac, PhD, Full Prof. Ivana Flanjak, PhD, Assoc. Prof.	
Course title	**Selected Topics in Food Quality and Safety (PSS-I-07)**	
Study programme	**PSS Innovations in Food Production**	
Course status	Elective	
Year of study	1	
Credits and Teaching Method (number of classes)	ECTS	3
	Number of classes (L+E+S)	20 (15-0-5)

1. COURSE DESCRIPTION		
1.1. Course aims		
The course discusses the current food legislation and future challenges for safety and quality, as well as possible solutions and ways of consumer protection, with particular reference to the following topics: Food safety challenges; Food authenticity - how to protect consumers and producers; Food authenticity testing; Novel food; Understanding consumers food products - how to choose the food. Perception of risk and influence on purchase behaviour. Ethics in the food chain.		
1.2. Prerequisites for enrolment		
-		
1.3. Learning outcomes at the course level		
After completing this course student will be able to: - critically evaluate the legislation and consumer protection legislation tools - assess new risks to food safety and risk reduction strategies - evaluate and recommend methods for testing selected types of food authenticity - critically evaluate novel food legislation, and novel food products - evaluate key influences on consumer food choice - evaluate and promote ethical approach in the food chain		
1.4. Course content		
Food legislation, current state and challenges. Challenges for food safety and risk reduction strategies. Novel food. Issues and methodologies in food authenticity. Understanding consumers -how to choose the food. Food safety risk: Consumer perception and purchase behaviour. Ethics in food production.		
1.5. Class-related activities	☒ lectures ☒ seminars and workshops ☐ exercizes ☐ distance learning ☐ field work	☐ individual tasks ☐ multimedia and network ☐ laboratory ☐ mentored activity ☐ other _____
1.6. Commentaries		
1.7. Students' obligations		
Students are expected to actively participate in classes, write and present a seminar paper: The topic of the seminar is chosen by the student at the beginning of class, prepares a written paper and presents it (Power Point) to colleagues in class.		

1.8. Monitoring the activitiy of students

Class attendance	0.25	Class activites	0.25	Seminary work	1.5	Experimental work	
Written exam		Oral exam	1.0	Essay		Research	
Project		Continuous knowledge check		Report		Practical work	
Portfolio							

1.9. Grading of students during classes and at the final exam

Seminar paper and oral exam

1.10. Mandatory literature

Regulations, standard, scientific journals
D.Montet, R.C. Ray (ed.) Food Traceability and Authenticity: Analitical Techniques. CRC Press, 2017.
Lees M (ed): Food authenticity and traceability. Woodhead Publishing Limited, Cambridge 2003.
L. Frewer and H. Trijp (ed): Understanding consumer of food products. Woodhead Publishing Limited and CRC Press LLC. 2007.

1.11. Additional literature

Korthals M (ed): Before Dinner. Philosophy and Ethics of Food. Springer, Dordrecht 2004.

1.12. Number of copies of mandatory literature available in the library and via other media

Title	*Number of copies*	*Number of students*

1.13. Quality assurance procedures designed to ensure the acquisition of outcomes and competencies

Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Food Technology Osijek
Course teacher may use other surveys for quality monitoring.

General information		
Course holder	Daniela Čačić Kenjerić, PhD, Full Prof.	
Course title	**Nutritional Aspects of New Food Product Development (PSS-I-08)**	
Study programme	**PSS Innovations in Food Production**	
Course status	Elective	
Year of study	1	
Credits and Teaching Method (number of classes)	ECTS	3
	Number of classes (L+E+S)	10 L +0 E +10 S

1. COURSE DESCRIPTION		
1.1. Course aims		
To present dietary guidelines for targeted consumer subgroups and to introduce students with available options for implementing new knowledge from the field of nutrition into new product.		
1.2. Prerequisites for enrolment		
-		
1.3. Learning outcomes at the course level		
Aa a result of completed course student will be able 1. To list basic dietary guidelines for specific consumer groups 2. To identify the options for the product reformulation 3. To recommend reformulation which presents the best fit for the targeted consumer subgroup 4. To present package which presents the best fit for the product considering recommended portion size and dietary intake for the targeted consumer		
1.4. Course content		
Dietary guidelines for selected consumer subgroups (infants, children, adults, pregnant women, elderly, persons with food allergies and intolerances, etc.). Food reformulation (sugar content reduction, salt content reduction, fat content reduction, saturated fat content reduction, etc.) and food labelling aimed at consumer health protection. Portion size as the basis for package size selection. Dietary and health claims. Individual conversatory tasks for students: To elaborate the concept of a new product development (by students´ choice) from the aspect of recommended dietary intake.		
1.5. Class-related activities	☒ lectures ☒ seminars and workshops ☐ exercizes ☐ distance learning ☐ field work	☒ individual tasks ☐ multimedia and network ☐ laboratory ☐ mentored activity ☐ other _____
1.6. Commentaries		
1.7. Students' obligations		

Active participation in all types of classes; The analysis of a selected food product adequacy for the targeted consumers

1.8. Monitoring the activitiy of students

Lecture attendance	*	Class activities	0.3	Seminary work	1.5	Experimental work	
Written exam		Oral exam	1.2	Essay		Research	
Project		Continuous knowledge check		Report		Practical work	
Portfolio							

1.9. Grading of students during classes and at the final exam

Students will be graded based on the evaluation of individual seminar reports and final oral exam.

1.10. Mandatory literature

- Dietary guidelines for selected population subgroups
- Dietary recommendations for specific nutrients
- Scientific papers
- Legislation and Official Policy Documents regarding nutrition and health claims in food labeling

1.11. Additional literature

-

1.12. Number of copies of mandatory literature available in the library and via other media

Title	*Number of copies*	*Number of students*

1.13. Quality assurance procedures designed to ensure the acquisition of outcomes and competencies

Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Food Technology Osijek
Course teacher may use other surveys for quality monitoring.

General information		
Course holder	Stela Jokić, Phd, Full Prof.	
Course title	**Optimization in the Development and Production of Food Products (PSS-I-09)**	
Study programme	**PSS Innovations in Food Production**	
Course status	Elective	
Year of study	1	
Credits and Teaching Method (number of classes)	ECTS	4 ECTS
	Number of classes (L+E+S)	10+5+10

2. COURSE DESCRIPTION		
1.1. Course aims		
Introduce students about potential application of computer programs in the development of new innovative products and optimization of industrial processes, all with the aim of saving time and resources. Provide skills and competencies of participants in the field of process optimization in the food industry. Apply and select the most successful and the most used optimization technique based on design of experiments, and to find the optimal process parameters.		
1.2. Prerequisites for enrolment		
-		
1.3. Learning outcomes at the course level		
After successful completion of this course students are expected to be able to: 1. Analyze different optimization techniques and select the most suitable ones for the development of new innovative products or processes 2. Apply computer programs and methods for simulation and optimization of industrial processes		
1.4. Course content		
Lectures: Theoretical bases on methods of process optimization using computer softwares. Application of Response Surface Methodology (RSM) for modelling and optimization of processes in food industries. Design of Experiments (DOE), Regression Analysis and Analysis of Variance (ANOVA). Factorial Design, Central-Composite Design, Box-Behnken Design etc. **Seminars:** Examples of experimental design and optimization of selected processes in the food industry. **Exercises:** Optimization of the selected production processes in the food industry using software Design Expert and applying the Response Surface Methodology. Experimental data will be processed by the statistical methods of linear regression and multivariate analysis of variance.		
1.5. Class-related activities	☒ lectures ☒ seminars and workshops ☒ exercizes ☐ distance learning ☐ field work	☒ individual tasks ☐ multimedia and network ☐ laboratory ☐ mentored activity ☐ other _____
1.6. Commentaries		

1.7. Students' obligations

Attendance at all forms of classes is mandatory and the students are obligated to attend to oral exam

1.8. Monitoring the activitiy of students

Class attendance		Class activities		Seminary work	0,75	Experimental work	0,75
Written exam		Oral exam	1,25	Essay		Research	1,25
Project		Continuous knowledge check		Report		Practical work	
Portfolio							

1.9. Grading of students during classes and at the final exam

Monitoring the activity of the students (Connecting Learning Outcomes, Teaching Methods, and Grading)
A – Excellent (5): 90-100 grade points; B – Very Good (4): 80-89.99 grade points; C – Good (3): 70-79.00 grade points; D – sufficient (2): 60-69.99 grade points; E- insufficient (1): 0 – 59.99 grade points

1.10. Mandatory literature

Raymond H. Myers, Douglas C. Montgomery, Christine M. Anderson-Cook. Response surface methodology: Process and Product Optimization Using Designed Experiments. John Wiley & Sons, Inc. 2016.
Scientific and professional paper

1.11. Additional literature

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1.12. Number of copies of mandatory literature available in the library and via other media

Title	*Number of copies*	*Number of students*

1.13. Quality assurance procedures designed to ensure the acquisition of outcomes and competencies

Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Food Technology Osijek
Course teacher may use other surveys for quality monitoring.

General information		
Course holder	Frane Čačić Kenjerić, PhD, Assoc. Prof.	
Course title	**Fourth Industrial Revolution and Food Production (PSS-I-10)**	
Study programme	**PSS Innovations in Food Production**	
Course status	Elective	
Year of study	1	
Credits and Teaching Method (number of classes)	ECTS	
	Number of classes (L+E+S)	20+0+5

1. COURSE DESCRIPTION		
1.1. Course aims		
Understand the development of industrial automation, from the first industrial revolution to the present day. Getting acquainted with the concept and the basis of the initiative known as 'Industry 4.0' or the fourth industrial revolution, namely the new organizational paradigms of value creation (goods) in industrial production. Get to know the basic new technologies: Internet of Things IoT, Cloud Cloud, Big Data and Data Mining, and physico-cybernetic systems in production (Cyber-Physical Sytems CPS). Know the benefits and challenges posed by "Industry 4.0". Understand the concept of "smart factory" and understand the impact on the development of the food industry and society.		
1.2. Prerequisites for enrolment		
None.		
1.3. Learning outcomes at the course level		
After finishing coure students will be able to: 1. Define and explain main concepts of Industry 4.0 2. List and distinguish main characteristics of today's industry and Industry 4.0 3. Apply new technologies in the improvement and development of new innovative products 4. Assess the risks associated with Industry 4.0 paradigm 5. Predict benefits associated with the application of Industry 4.0 paradigm		
1.4. Course content		
Development of industrial production and automation. The term Industry 4.0 and its meaning. Basics of Industry 4.0. Physical- cyber production systems. Networking and the Internet of Things. Application of cloud technology in production automation. Big data. Data mining. The application of artificial intelligence in data processing and analysis. Smart factories. Safety risks and protection. Application to the food industry.		
1.5. Class-related activities	☒ lectures ☒ seminars and workshops ☐ excersizes ☒ distance learning ☐ field work	☒ individual tasks ☐ multimedia and network ☐ laboratory ☐ mentored activity ☐ other _____
1.6. Commentaries		
1.7. Students' obligations		

Attendance of classes and seminars, and preparation of seminar work on a given topic and passing the final exam (written).

1.8. Monitoring the activitiy of students

Class attendance	0,4	Class activities		Seminary work	2	Experimental work	
Written exam	1,6	Oral exam		Essay		Research	
Project		Continuous knowledge check		Report		Practical work	
Portfolio							

1.9. Grading of students during classes and at the final exam

0% to 59.99% insufficient (1), 60.00% to 69.99% sufficient (2), 70.00% to 79.00% good (3), 80.00% to 89.99% % very good (4), 90.00% to 100.00% excellent (5)

Interaction during teaching (discussions), monitoring of the preparation of seminar work, presentation of seminar work with discussion, and through the final exam.

1.10. Mandatory literature

Edited by R. Buyya, A. V. Dastjerdi: Internet of Things Principles and Paradigms, Morgan Kaufman, 2016.
C. J. Bartodziej: The Concept Industry 4.0 An Empirical Analysis of Technologies and Applications in Production Logistics, Springer Gabler, 2017.

1.11. Additional literature

1.12. Number of copies of mandatory literature available in the library and via other media

Title	*Number of copies*	*Number of students*

1.13. Quality assurance procedures designed to ensure the acquisition of outcomes and competencies

Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Food Technology Osijek
Course teacher may use other surveys for quality monitoring.

General information		
Course holder	Natalija Velić, PhD, Assoc. Prof.	
Course title	**Sustainable Food Production (PSS-I-11)**	
Study programme	**PSS Innovations in Food Production**	
Course status	elective	
Year of study	1	
Credits and Teaching Method (number of classes)	ECTS	
	Number of classes (L+E+S)	10 L + 0 E + 10 S

1. COURSE DESCRIPTION		
1.1. Course aims		
To introduce students to the basic principles of sustainable development in food production and processing**.**		
1.2. Prerequisites for enrolment		
-		
1.3. Learning outcomes at the course level		
Upon completion of the course, students will be able to: 1. Define the importance of applying the basic principles of sustainable development in food production and processing 2. Identify sustainable patterns of food production and consumption. 3. Know, differentiate and apply sustainable techniques and processes of food production and processing and processing of production waste flows. 4. Recognize and apply the principles of sustainable development in the use of energy in the food industry and in the food distribution chain		
1.4. Course content		
Basic principles of sustainability in food production and processing (three pillars of sustainable development - environmental responsibility, economic responsibility, responsibility towards society). Circular economy vs. linear economy. Sustainable production patterns and food consumption. Sustainable food processing techniques and processes. Sustainable packaging materials. Life cycle of products and packaging (LCA). Valorisation and waste management in the food industry - reuse of production residues, reduction of waste volumes and treatment of waste streams (wastewater, solid waste, exhaust gases). Energy efficiency and use of renewable energy sources in the food industry. Sustainability in the food distribution chain.		
1.5. Class-related activities	☒ lectures ☐ seminars and workshops ☐ exercizes ☐ distance learning ☒ field work	☒ individual tasks ☐ multimedia and network ☐ laboratory ☒ mentored activity ☐ other _____
1.6. Commentaries		
1.7. Students' obligations		
Participation in all forms of teaching (lectures, field work), seminar work.		

1.8. Monitoring the activitiy of students

Class attendance	0,4	Class activities	0,1	Seminary work	1,5	Experimental work	
Written exam		Oral exam	1	Essay		Research	
Project		Continuous knowledge check		Report		Practical work	
Portfolio							

1.9. Grading of students during classes and at the final exam

Records of class participation and activities, evaluation of seminar work, and oral examination.

1.10. Mandatory literature

1. Grujić R., Jašić M., Održive tehnologije u prehrambenoj industriji, Tehnološki fakultet Univerziteta u Novom Sadu, 2013. ISBN 978-86-6253-012-7. (http://www.tf.uns.ac.rs/tempusIV/documents/files/Book2_Prehrambena_industrija_short.pdf)
2. Tiwari B. K., Norton T., Holden N. M., *Sustainable Food Processing*, Wiley Blackwell, West Sussex, UK, 2014.

1.11. Additional literature

Baldwin C., *Sustainability in the Food Industry*, Wiley-Blackwell, IFT Press, Iowa, 2009.

1.12. Number of copies of mandatory literature available in the library and via other media

Title	*Number of copies*	*Number of students*

1.13. Quality assurance procedures designed to ensure the acquisition of outcomes and competencies

Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Food Technology Osijek
Course teacher may use other surveys for quality monitoring.

General information		
Course holder	Lidija Jakobek Barron, PhD, Full Prof.	
Course title	**Development and Design of Packaging for a New Product (PSS-I-12)**	
Study programme	**PSS Innovations in Food Production**	
Course status	elective	
Year of study	1	
Credits and Teaching Method (number of classes)	ECTS	3
	Number of classes (L+E+S)	20 (15+0+5)

1. COURSE DESCRIPTION		
1.1. Course aims		
The aim of the course is to introduce students to traditional and newer packaging materials, to the ecological aspects of packaging and to provide basic knowledge of the development and design of packaging for a particular product, according to its properties. In addition, the goal is for students to independently develop and design packaging and assess the importance of packaging design for product sales.		
1.2. Prerequisites for enrolment		
1.3. Learning outcomes at the course level		
After completing the course and passing the exam, students will be able to: 1. Define the properties of traditional and new packaging materials and trends in the development of packaging materials 2. Define environmentally friendly packaging and the role of recycling in the development of packaging materials 3. Analyze the steps in designing packaging for a new product 4. Create, design, and develop new packaging for the product 5. Assess the importance of packaging for product sales		
1.4. Course content		
Significance of packaging and trends. Traditional packaging (metal, glass, paper and cardboard, polymer, multilayer). Newer packaging materials (biodegradable polymers, active and intelligent packaging, edible packaging). Environmentally friendly packaging. Packaging recycling. Packaging design (design elements, information, packaging labels). Adaptation of packaging to product properties. Steps in product packaging development and design. Development of packaging for a specific product.		
1.5. Class-related activities	☒ lectures ☒ seminars and workshops ☐ exercizes ☒ distance learning ☐ field work	Individual tasks ☐ multimedia and network ☐ laboratory ☐ mentored activity ☐ other _____
1.6. Commentaries		
1.7. Students' obligations		
Attend lectures and seminars, and participate in distance learning. Conduct independent work creating and designing a package for a particular new product, and take exams.		
1.8. Monitoring the activity of students		

Class attendance	0,5	Class activities		Seminary work		Experimental work	
Written exam	0,5	Oral exam		Essay	1	Research	
Project	1	Continuous knowledge check		Report		Practical work	
Portfolio							

1.9. Grading of students during classes and at the final exam

Records of class attendance, preparation of project assignment and essay, final exam

1.10. Mandatory literature

1. Robertson, G.L. Food Packaging. Principles and Practice. Marcel Deker Inc., New York, Basel, 1993.
2. Emblem, A., Emblem, H. Packaging Technology, Fundamentals, Materials and Processes. Woodhead Publishing Limited, Cambridge, 2012

1.11. Additional literature

1. Muhamedbegović, B., Juul, N.V., Jašić, M. Ambalaža i pakiranje hrane. Off-Set d.o.o., Tuzla, 2015.

1.12. Number of copies of mandatory literature available in the library and via other media

Title	*Number of copies*	*Number of students*

1.13. Quality assurance procedures designed to ensure the acquisition of outcomes and competencies

Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Food Technology Osijek
Course teacher may use other surveys for quality monitoring.

General information		
Course holder	Drago Šubarić, PhD, Full Prof. Associate: Antun Jozinović, PhD, Assistant Prof.	
Course title	**Innovative Food Processing Techniques (PSS-I-13)**	
Study programme	**PSS Innovations in Food Production**	
Course status	Elective	
Year of study	1	
Credits and Teaching Method (number of classes)	ECTS	3
	Number of classes (L+E+S)	20 (15+2+3)

1. COURSE DESCRIPTION		
1.1. Course aims		
The aim of this course is to gain knowledge about the latest techniques used in the food processing and food preservation with an emphasis on new non-thermal and thermal processing methods and principles of minimal food processing.		
1.2. Prerequisites for enrolment		
-		
1.3. Learning outcomes at the course level		
After attending lectures and successfully completing seminars and exercises, learning independently, and passing the exam, the students will be able to: 1. Interpret the principles of food preservation and to compare conventional methods of conservation with new techniques. 2. Analyze and implement new non-thermal food processing methods. 3. Analyze and implement new thermal food processing methods. 4. Propose appropriate innovative processes to improve product quality and improve the technological process. 5. Define and explain the principles and methods of minimal food processing.		
1.4. Course content		
Lectures. Principles of food preservation, conventional methods and the latest achievements in food processing and preservation processes. New techniques for food preservation: a) non-thermal methods - ultrasound, pulsed electric field, light of high intensity, oscillating magnetic field, high hydrostatic pressure, cold plasma, ionizing radiation; b) thermal methods: ohmic heating, radio frequency, microwaves. Innovative techniques in refrigeration and freezing processes. Principles and methods of minimal food processing. Seminar. Innovative food processing techniques and the potential of their application. Laboratory exercises. Application of various innovative techniques (pulsed electric field, high voltage electric discharge, ultrasound, microwaves) for food processing.		
1.5. Class-related activities	x lectures x seminars and workshops x exercises ☐ distance learning ☐ field work	x individual tasks ☐ multimedia and network x laboratory ☐ mentored activity ☐ other _____
1.6. Commentaries		
1.7. Students' obligations		

Class attendance, completed laboratory exercises, independent preparation of a seminar work on a given topic, taking an oral exam.

1.8. Monitoring the activitiy of students

Class attendance	0,3	Activity on the class		Seminar work	0,6	Experimental work	0,3
Written exam		Oral exam	1,8	Essay		Research	
Project		Continuous knowledge check		Report		Practical work	
Portfolio							

1.9. Grading of students during classes and at the final exam

Keeping records of class attendance, assessment of laboratory activities, assessment of seminar work and oral exam.

1.10. Mandatory literature

Herceg Z: Procesi konzerviranja hrane – Novi postupci. Golden marketing-Tehnička knjiga, Zagreb, 2009.
Sun D-W: Emerging Technologies for Food Processing. Elsevier Ltd., 2015.

1.11. Additional literature

Lovrić, T: Procesi u prehrambenoj industriji s osnovama prehrambenog inženjerstva. Hunus, Zagreb, 2003.

Herceg Z: Procesi u prehrambenoj industriji: Prehrambeno-procesno inženjerstvo 1. Plejada, Zagreb, 2011.

Knoerzer K, Juliano P, Smithers G: Innovative Food Processing Technologies - Extraction, Separation, Component Modification and Process Intensification. Woodhead Publishing, 2016.

Scientific and professional papers related to individual chapters (available online)

1.12. Number of copies of mandatory literature available in the library and via other media

Title	*Number of copies*	*Number of students*
Procesi konzerviranja hrane – Novi postupci	1	
Emerging Technologies for Food Processing	1	
Procesi u prehrambenoj industriji s osnovama prehrambenog inženjerstva	1	
Procesi u prehrambenoj industriji: Prehrambeno-procesno inženjerstvo 1	1	
Innovative Food Processing Technologies - Extraction, Separation, Component Modification and Process Intensification	1	

1.13. Quality assurance procedures designed to ensure the acquisition of outcomes and competencies

Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Food Technology Osijek
Course teacher may use other surveys for quality monitoring.

General information		
Course holder	Ivana Flanjak, PhD, Assoc. Prof.	
Course title	**Sensory Characterisation of New Product (PSS-I-14)**	
Study programme	**PSS Innovations in Food Production**	
Course status	Elective	
Year of study	1	
Credits and Teaching Method (number of classes)	ECTS	3
	Number of classes (L+E+S)	20 (15-0-5)

1. COURSE DESCRIPTION							
1.1. Course aims							
The aim of this course is to acquire knowledge of the importance of sensory analysis in different phases of new product development and implementation of sensory technologies and methods in new product characterisation.							
1.2. Prerequisites for enrolment							
-							
1.3. Learning outcomes at the course level							
After completing this course student will be able to: - explain the methodology and describe methods of sensory analysis, identify advantages and disadvantages of each method - know and evaluate the importance of sensory analysis in different phases of new product development - recommend the appropriate method that will best assess the possibility of success of a new product on the market - implement novel methodologies for sensory characterisation and statistical data analysis							
1.4. Course content							
Methodology of sensory analysis (organization, location of test, types of tests, assessors: selection, training, monitoring, application and statistical analysis). Importance of sensory analysis in new product development, food reformulation, quality control and market research. Sensory analysis, sensory marketing and consumer's behaviour. Novel methodologies for sensory characterisation, practical applications.							
1.5. Class-related activities	☒ lectures ☒ seminars and workshops ☐ exercizes ☐ distance learning ☐ field work	☐ individual tasks ☐ multimedia and network ☐ laboratory ☐ mentored activity ☐ other _____					
1.6. Commentaries							
1.7. Students' obligations							
Students are expected to actively participate in classes, write and present a seminar paper:							
1.8. Monitoring the activitiy of students							
Class attendance	0.25	Class activities	0.25	Seminary work	1.5	Experimental work	

Written exam		Oral exam	1.0	Essay		Research	
Project		Continuous knowledge check		Report		Practical work	
Portfolio							

1.9. Grading of students during classes and at the final exam

Seminar paper and oral exam

1.10. Mandatory literature

Standards and scientific papers form the field of sensory analysis
Meilgaard M., Civille G.V., Carr B.T.: Sensory Evaluation Techniques. CRC Press Inc, London 2007.
Kemp E.S.,Hollowood T, Hort J.: Sensory Evaluation A practical Handbook. Wiley Black Well, Oxford 2009.

1.11. Additional literature

Varela P., Ares G.: Novel Techniques in Sensory Characterization and Consumer Profiling. CRC Press Inc, Boca Raton, 2014.

1.12. Number of copies of mandatory literature available in the library and via other media

Title	*Number of copies*	*Number of students*

1.13. Quality assurance procedures designed to ensure the acquisition of outcomes and competencies

Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Food Technology Osijek
Course teacher may use other surveys for quality monitoring.

General information		
Course holder	Ivan Kelic, PhD, Assistant Prof.	
Course title	**Consumer Behavior in the Digital Environment (PSS-I-15)**	
Study programme	**PSS Innovations in Food Production**	
Course status	Elective	
Year of study	1	
Credits and Teaching Method (number of classes)	ECTS	4
	Number of classes (L+E+S)	15+0+0

1. COURSE DESCRIPTION

1.1. Course aims

The course will introduce participants to theories and empirical models of consumer behavior and purchasing decisions and the role of marketing activities based on consumer behavior in a particular situation and environment through the economy of experience. The course aims to enable creative thinking techniques to generate ideas on how and where to find consumers and how to enter their consciousness through the modern paradigm of consumer behavior. How owning (or not owning) things affect consumers' lives, how what they possess affects their experiences, and how they perceive others.

Furthermore, participants will be explained the changes in consumer behavior brought about by digitalization and technology. Social networks and networking of people, sales channels (web shopping), influencers, and bloggers are changing consumers' perceptions and traditional roles. From the passive role of a product or service user, networked, informed, trained consumers are looking for an active role in creating new value. As value shifts to experience, the interaction between consumers and companies becomes the basis for dialogue. Establishing dialogue requires understanding, transparency, and accountability, but the dynamism of cooperation opens up opportunities for new market successes.

1.2. Prerequisites for enrolment

Completed graduate study (according to the old program four or five-year study), and students who completed the first two cycles and collected 300 ECTS credits according to the Bologna process. It is not necessary to take the exam difference if the student comes from another faculty.

1.3. Learning outcomes at the course level

1. Explain the individual factors that influence consumer behavior
2. Analyze the stages of the purchase decision process
3. Identify critical factors that influence purchasing decisions
4. Compare the behavior of end and business consumers
5. Assess the impact of business consumers on the business strategy of the business entity
6. Identify unethical actions of business entities towards consumers
7. Indicate the importance of connecting consumers
8. Master creative thinking techniques to solve a business problem.
9. Awareness of changes in consumer behavior brought about by digitalization (influencers, bloggers, social networks)

1.4. Course content

1. Introduction to consumer behavior and marketing strategy. (What is and how do we monitor consumer behavior? The importance of consumer behavior for marketing activities, strategy. Seven fundamental theses of consumer behavior)
2. Social factors and consumer behavior: Culture. Socialization. Society and social class. Social groups. Family. Situational factors.
3. Personal factors: Motivation and motives. Perceptions. Attitudes of belief. Personality traits, values, lifestyle, knowledge.

4. Psychological processes. Information processing process: The learning process. The process of changing attitudes and behaviors.
5. Purchase decision-making process. It understands the problem. Searching and evaluating information. Shopping. Post-purchase behavior. Customer behavior models.
6. Organizational / business customer (B2B) behavior frameworks
7. Other aspects of consumer behavior. Marketing communication. Spreading innovation. Consumer protection. Creativity - evolution, and revolution. Neuromarketing.
8. Social networks, influencers, bloggers and their impact on the consumer behavior.

1.5. Class-related activities	☒ lectures ☒ seminars and workshops ☐ exercizes ☐ distance learning ☐ field work	☐ individual tasks ☐ multimedia and network ☐ laboratory ☐ mentored activity ☐ other _____
1.6. Commentaries		

1.7. Students' obligations

1.8. Monitoring the activitiy of students

Class attendance		Class activities		Seminary work	X	Experimental work	
Written exam		Oral exam		Essay		Research	
Project	X	Continuous knowledge check		Report		Practical work	
Portfolio							

1.9. Grading of students during classes and at the final exam

1.10. Mandatory literature

1. Solomon, M. R., Bamossy, G., Askegaard, S., & Hogg, M. K. (2015). Ponašanje potrošača, europska slika. MATE doo Zagreb, Zagreb.
2. Grbac,B.;Lončarević,D.(2010).Ponašanje potrošača na tržištu krajnje i poslovne potrošnje, Grafika Osijek
3. Kesić, T. (1999.).Ponašanje potrošača. ADECO,Zagreb
4. Korkut, D., & Kopal, R. (2018). CREATIVITY 4.0: evolution and revolution.
5. Lieberman, M.B., Balasubramanian, N., Garcia-Castro, R. (2018). Toward a Dynamic Notion of Value Creation and Appropration in Firms. The Concept and Masurement of Economic Gain. Strategic Management Journal, Vol. 39 ,6, str. 1546-1572.

1.11. Additional literature

1. Engel,J.F.,et al.(2000).CosumerBehavior, TheDrydenPress
2. Hawkins,I.D.,et al.(2000).ConsumerBehavior-Implications for Marketing Strategy,Irwin,Chicago
3. Schiffman,L.,Kanuk,L.L.(2003).ConsumerBihavior,8th ED.,Prentice-Hall
4. Solomon,M.R.(2003).ConsumerBihavior,6th Ed.,Prentice-Hall
5. Čolić, S. (2013). Potrošačka kultura i konzumerizam, 2013. Institut društvenih znanosti Ivo Pilar, Zagreb.
6. Prahalad, C.K., Ramaswamy, V. (2004). Co-creation experiences: the next practice in value creation. Journal of interactive marketing. 18,3.

1.12. Number of copies of mandatory literature available in the library and via other media

Title	*Number of copies*	*Number of students*

Solomon, M. R., Bamossy, G., Askegaard, S., & Hogg, M. K. (2015). Ponašanje potrošača, europska slika. MATE doo Zagreb, Zagreb.	4	15

1.13. Quality assurance procedures designed to ensure the acquisition of outcomes and competencies

Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Food Technology Osijek
Course teacher may use other surveys for quality monitoring.

General information		
Course holder	Sanja Pfeifer, PhD, Full Prof.	
Course title	**Managing Creativity Processes (PSS-I-16)**	
Study programme	**PSS Innovations in Food Production**	
Course status	Elective	
Year of study	1	
Credits and Teaching Method (number of classes)	ECTS	3
	Number of classes (L+E+S)	15+0+5

1. COURSE DESCRIPTION		
1.1. Course aims		
Under conditions of increasingly scarce natural resources, on which economic growth was based in the past, modern societies are focusing on more effective use of human capital, including the ability to solve problems creatively. The course trains participants to manage the key factors in creative thinking and creative problem solving at the individual and organizational levels. Upon completion of the course, participants will be able to select and apply various creativity techniques and manage creativity-intensive processes in a business context.		
1.2. Prerequisites for enrolment		
There are no additional enrollment requirements for the course other than those specified in the enrollment requirements of the study. The study can be enrolled by anyone who has completed a graduate degree (according to the old program 4 or 5 years of study) and by students who have completed the first two cycles according to Bologna Process and have accumulated 300 ECTS credits. It is not necessary to take a course difference if the student comes from another faculty.		
1.3. Learning outcomes at the course level		
Upon completion of the course, students will be able to: 1. describe the sources of creativity and the most common criteria for evaluating creative abilities 2. distinguish and explain the key factors in the process of creative thinking and creative problem solving 3. analyze and evaluate the impact of barriers that limit creative thinking, as well as suggest and apply techniques to minimize them 4. Apply specific techniques to promote creative thinking at different stages of the creative process (from problem identification, generation of alternatives, evaluation to implementation of creative solutions) 5. Use and promote their own creativity and contribute constructively to creativity in the team and in the organization 6. Critically evaluate the management of creativity-intensive processes at the level of enterprise or economy		
1.4. Course content		
The role, importance and contribution of creative thinking. The concept of the Herrmann's Whole Brain Model. Creative problem solving model. Barriers to creative problem solving. Techniques of creative approach to a problem. Alternative generation techniques. Alternative evaluation techniques. Techniques for implementing creative solutions. Managing creativity in a business context. Creative industries and creative economy.		
1.5. Class-related activities	☒ lectures ☒ seminars and workshops ☐ exercizes ☒ distance learning ☐ field work	☒ individual tasks ☐ multimedia and network ☐ laboratory ☐ mentored activity ☐ other _____
1.6. Commentaries		
1.7. Students' obligations		

1.8. Monitoring the activitiy of students

Class attendance	0,5	Class activities	0,5	Seminary work		Experimental work	
Written exam		Oral exam		Essay	0,5	Research	
Project	1	Continuous knowledge check		Report		Practical work	0,5
Portfolio							

1.9. Grading of students during classes and at the final exam

1.10. Mandatory literature

1. Pfeifer, S: Kreativnost i inovativnost na portalu za udaljeno učenje: merlin.srce.hr
2. Seelig, Tina L: inGenius: A Crash Course on Creativity, HarperCollins Publishers, New York, 2012.
3. Howkins, J: Kreativna ekonomija, Binoza, Zagreb, 2001
4. Whetten, S.A.; Cameron, K.S: Developing Management Skills, Addison-Wesley, 1998. Ch 3

1.11. Additional literature

1. Teresa M. Amabile; Regina Conti; Heather Coon; Jeffrey Lazenby; Michael Herron: Assessing the Work Environment for Creativity, The Academy of Management Journal, Vol. 39, No. 5. (Oct., 1996), pp. 1154-1184.
2. Michalko, M: Cracking Creativity, Ten Speed Press, 1998.

1.12. Number of copies of mandatory literature available in the library and via other media

Title	*Number of copies*	*Number of students*
Pfeifer, S: Kreativnost i inovativnost – Nastavni materijali – merlin.srce.hr	Open access on merlin.srce. hr	
Seelig, Tina L: inGenius: A Crash Course on Creativity, HarperCollins Publishers, New York, 2012.	1	
Howkins, J: Kreativna ekonomija, Binoza, Zagreb, 2001	1	
Whetten, S.A.; Cameron, K.S: Developing Management Skills, Addison-Wesley, 1998. Ch 3	1	

1.13. Quality assurance procedures designed to ensure the acquisition of outcomes and competencies

Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Food Technology Osijek
Course teacher may use other surveys for quality monitoring.

General information		
Course holder	Antun Biloš, PhD, Assoc. Prof. Davorin Turkalj, PhD, Assoc. Prof.	
Course title	**Digital Marketing and Marketing Communication (PSS-I-17)**	
Study programme	**PSS Innovations in Food Production**	
Course status	Elective	
Year of study	1	
Credits and Teaching Method (number of classes)	ECTS	3
	Number of classes (L+E+S)	20+0+0

1. COURSE DESCRIPTION		
1.1. Course aims		
Adoption of key principles of digital marketing and global digital market as well as application of communication tools and techniques within the digital environment.		
1.2. Prerequisites for enrolment		
1.3. Learning outcomes at the course level		
1. To identify recent trends of information and communication technologies. 2. To interpret marketing significance of selected communication tools within the digital environment. 3. To analyze the sum of digital marketing activities of a selected company 4. To evaluate basic promotional techniques within the digital environment. 5. To elaborate the segmentation possibilities of digital marketing communication. 6. To critically asses basic business models of the digital market.		
1.4. Course content		
1. Introduction to digital marketing 2. Internet i internet information space 3. Web-sites and content management systems 4. Social networking 5. E-mail communication and busines correspondence 6. Digital marketing mix 7. Digital promotion mix specifics 8. E-business i e-commerce		
1.5. Class-related activities	☒ lectures ☐ seminars and workshops ☐ exercizes ☒ distance learning ☐ field work	☒ individual tasks ☒ multimedia and network ☐ laboratory ☐ mentored activity ☐ other _____
1.6. Commentaries		
1.7. Students' obligations		
Participation and active involvement in class activities, student assignment and distance learning elements, exam or presentation of special assignments.		
1.8. Monitoring the activitiy of students		

Class attendance	0,5	Class activities	0,5	Seminary work		Experimental work	
Written exam		Oral exam	1	Essay		Research	
Project		Continuous knowledge check		Report		Practical work	
Portfolio		Assignment	1				

1.9. Grading of students during classes and at the final exam

Class attendance and activity records, assignment evaluation.

1.10. Mandatory literature

Ružić, D., Biloš, A., Turkalj, D. (2014) E-marketing, 3. izmijenjeno i dopunjeno izdanje. Osijek: Ekonomski fakultet u Osijeku.
Chaffey, D., & Smith, P. R. (2017). Digital Marketing Excellence: Planning, Optimizing and Integrating Online Marketing. Taylor & Francis.
Lecture notes

1.11. Additional literature

Laudon, K., Traver, C. (2015) E-commerce 2015. 11. izdanje. Essex: Pearson Education Limited.

Barker, M.S., Barker, D.I., Bohrmann, N.F., Neher, K.E. (2013) Social Media Marketing: A strategic approach. Mason: South Western.

1.12. Number of copies of mandatory literature available in the library and via other media

Title	*Number of copies*	*Number of students*

1.13. Quality assurance procedures designed to ensure the acquisition of outcomes and competencies

Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Food Technology Osijek
Course teacher may use other surveys for quality monitoring.

General information		
Course holder	Sunčica Oberman Peterka, PhD, Full Prof. Anamarija Delić, PhD, Assoc. Prof.	
Course title	**New Venture Creation (from Idea to Realization) (PSS-I-18)**	
Study programme	**PSS Innovations in Food Production**	
Course status	Elective	
Year of study	1	
Credits and Teaching Method (number of classes)	ECTS	5
	Number of classes (L+E+S)	20+0+10

1. COURSE DESCRIPTION		
1.1. Course aims		
The goal of the course is introduction to entrepreneurial process of new venture creation on the level of understanding and acquisition of knowledge and skills HOW to do that. The main goal is to enable students for independent development and presentation of business plan, based on their own idea and differentiation between idea and business opportunity and methods for evaluating business opportunity.		
1.2. Prerequisites for enrolment		
Student needs to be enrolled in the program.		
1.3. Learning outcomes at the course level		
After the course, students will be able to: 1. Explain the difference between business idea and business opportunity 2. Evaluate chosen business opportunity 3. Think about their own business idea and design a business plan for its realization 4. Consider possible risks for new venture creation 5. Present their business plan		
1.4. Course content		
Main elements of business and strategic planning. Identification of critical aspects of new venture creation. Business opportunity recognition, needed resources identification and ways of business venture financing. Business plan as a tool for evaluationg business opportunity and its implementation in new business venture. Risk analyses.		
1.5. Class-related activities	☒ lectures ☐ seminars and workshops ☐ exercizes ☐ distance learning ☐ field work	☒ individual tasks ☐ multimedia and network ☐ laboratory ☒ mentored activity ☐ other _____
1.6. Commentaries		
1.7. Students' obligations		
Attending and participating in the course, doing individual and team projects and writing and presenting the business plan.		
1.8. Monitoring the activitiy of students		

Class attendance	1	Class activities	0,5	Seminary work		Experimental work	
Written exam	1,5	Oral exam		Essay		Research	
Project	2	Continuous knowledge check		Report		Practical work	
Portfolio							

1.9. Grading of students during classes and at the final exam

Recording participation, evaluating essays and projects

1.10. Mandatory literature

- Timmons, J.A.: *New Venture Creation, Entrepreneurship for the 21st century, 7th ed., McGraw Hill, 2007*
- Barringer, B.R., Ireland, R.D. (2010), Poduzetništvo – uspješno pokretanje novih poduhvata, III izdanje, Centar za razvoj poduzetništva Tuzla, BIH

1.11. Additional literature

- Republika Hrvatska, Ministarstvo gospodarstva (2000), Poslovni plan poduzetnika; Misliti se može i bez novca u džepu, Masmedia, Zagreb (ur. Vladimir Žanić)
- Bangs, D.H. (1998), Kako napraviti poslovni plan s kojim će vaše poduzeće uspjeti, Centar za poduzetništvo Osijek i Jakubin i sin, Zagreb
- Delić, A., Oberman Peterka, S., Perić, J. (2014), Želim postati poduzetnik, Sveučilište Josipa Jurja Strossmayera u Osijeku, Ekonomski fakultet u Osijeku, Osijek
- Alpeza, M., Delić, A., Oberman Peterka, S., Krstić, D., Marković, N. (2014), Osmislite i provjerite svoju poduzetničku ideju: Vodič za sve one koji razmišljaju o ulasku u poduzetničke vode, Sveučilište Josipa Jurja Strossmayera u Osijeku, Ekonomski fakultet u Osijeku, Osijek

1.12. Number of copies of mandatory literature available in the library and via other media

Title	*Number of copies*	*Number of students*
Barringer, B.R., Ireland, R.D. (2010), Poduzetništvo – uspješno pokretanje novih poduhvata, III izdanje, Centar za razvoj poduzetništva Tuzla, BIH	3	
Republika Hrvatska, Ministarstvo gospodarstva (2000), Poslovni plan poduzetnika; Misliti se može i bez novca u džepu, Masmedia, Zagreb (ur. Vladimir Žanić)	1	
Bangs, D.H. (1998), Kako napraviti poslovni plan s kojim će vaše poduzeće uspjeti, Centar za poduzetništvo Osijek i Jakubin i sin, Zagreb	4	
Delić, A., Oberman Peterka, S., Perić, J. (2014), Želim postati poduzetnik, Sveučilište Josipa Jurja Strossmayera u Osijeku, Ekonomski fakultet u Osijeku, Osijek	10	
Alpeza, M., Delić, A., Oberman Peterka, S., Krstić, D., Marković, N. (2014), Osmislite i provjerite svoju poduzetničku ideju: Vodič za sve one koji razmišljaju o ulasku u poduzetničke vode, Sveučilište Josipa Jurja Strossmayera u Osijeku, Ekonomski fakultet u Osijeku, Osijek	10	

1.13. Quality assurance procedures designed to ensure the acquisition of outcomes and competencies

Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Food Technology Osijek Course teacher may use other surveys for quality monitoring.

General information		
Course holder	Aleksandar Erceg, PhD, Assoc. Prof. Julia Perić, PhD, Assoc. Prof. Jurislav Babić, PhD, Full Prof.	
Course title	**Project Management and Team Work (PSS-I-19)**	
Study programme	**PSS Innovations in Food Production**	
Course status	Elective	
Year of study	1	
Credits and Teaching Method (number of classes)	ECTS	4
	Number of classes (L+E+S)	15+0+10

1. COURSE DESCRIPTION		
1.1. Course aims		
The aim of the course is to explain the importance of operations (project management, lean thinking and teamwork) and to introduce students to various methods of improving the business systems used to create the company's main products and services. The course aims to equip students with the knowledge, skills and tools they need to improve the operational performance of the company as potential leaders and/or team members. The knowledge gained in this course will enable students to better manage the innovation process in food production.		
1.2. Prerequisites for enrolment		
There are no special requirements for enrolling in the course.		
1.3. Learning outcomes at the course level		
1. Review and present the conceptual and theoretical determinants of operations management 2. Identify the difference between groups and teams and evaluate the appropriateness of using both forms of work 3. Evaluate the role of the leader and the team member in the various stages of team development and apply the principles of successful team management 4. Apply and critically evaluate methods of project management and monitoring information on project implementation using various tools 5. Apply and compare the tools of Lean Thinking and identify 'waste' in business processes to improve business operations 6. Make critical judgements about the contribution of operations management in increasing the competitiveness of the organisation		
1.4. Course content		
1. Introduction to operations management 2. Team management 3. Project management 4. Lean thinking 5. Methods and systems of continuous progress		
1.5. Class-related activities	☒ lectures ☐ seminars and workshops ☐ exercises ☐ distance learning ☐ field work	☒ individual tasks ☐ multimedia and network ☐ laboratory ☐ mentored activity ☐ other _____
1.6. Commentaries		

1.7. Students' obligations

During the class, the student actively participates in the class and takes the material through a written and oral exam, as well as the preparation of independent assignments and the final project.

1.8. Monitoring the activity of students

Class attendance	0,5	Class activities	0,5	Seminary work		Experimental work	
Written exam	1,5	Oral exam		Essay		Research	
Project	1,5	Continuous knowledge check		Report		Practical work	
Portfolio							

1.9. Grading of students during classes and at the final exam

Class attendance records, essay and project evaluation

1.10. Mandatory literature

Horine, G., Vodič za upravljanje projektima, Dva i dva, Zagreb 2009.
Slack, N., Brandon-Jones, A., Johnston, R. Operations Management, 8th edition, Pearson, 2016,
Whetten, D.A. & K.S. Cameron: Developing managemant Skills, Pearson Prentice Hall, Eight edition, 2011.

1.11. Additional literature

1.12. Number of copies of mandatory literature available in the library and via other media

Title	*Number of copies*	*Number of students*

1.13. Quality assurance procedures designed to ensure the acquisition of outcomes and competencies

Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Food Technology Osijek
Course teacher may use other surveys for quality monitoring.

4.2. Structure of the study, rithm of studying, requirements for admission to following semester or trimester and requirements for courses

The maximum duration from the enrolment to completion of the study is 5 semesters. The candidate who does not complete the study in this period must pay 20% of total annual tuition for each year of extension.

Based on curricular activities (leactures, seminars, practice) the candidate must collect min. 40 ECTS and 20 ECTS are obtained by defence of postgraduate specialist thesis.

There are no specific pre-requisites for courses.

4.3. Elective courses from other study programmes

Students who have opted for courses from other study programmes or other postgraduate university studies (maximum 5 ECTS credits from elective courses) shall be graded after analysis of the credit system of the respective postgraduate study, i.e. after examination of the credit loads carried by the respective course.

4.4. The list of courses that may thought in English

All courses may be tought in English, if required.

4.5. The completion of the study

The study is considered completed after meeting all the prescribed study programme requirements or after obtaining at least60 ECTS credits and after public defence of the specialist thesis.

At the beginning of the study, each student is given a mentor, based on student's area of work and desires. Mentor takes care of involving the student into scientific and professional research, helps the student in the election of courses and thesis theme.

Regardless the scope covered by specific courses in the study, the theme of thesis must be in the field of innovations in food production.

The theme of the theseis is proposed on the form (title, description and literature) after obtaining min. 10 ECTS credits. After the theme is accepted by the Committee for specialist study, the final decision is made by the Faculty Council.

After the completion of the thesis, Faculty Council, based on the recommendation of the Committee for the specialist study names the Board for grading and defence of specialist thesis. Members of the board may be teacher with titles from assistant to full professor in tenure, or research associate to scientific adviser in tenure, from the field of the thesis. Mentor of the thesis does not have to be envolved in teaching at the study.

4.6. Conditions for continuation of discontinued studies

In accordance with the Rulebook on Postgraduate Studies at the Josip Juraj Strossmayer University of Osijek:

- A student who has lost the status of a postgraduate student due to interruption of study may continue his / her studies if more than three years have elapsed since the day of study interruption and that the study program has not been significantly changed (more than 20%) by the one who enrolled.
- The application for the continuation of the study program shall be submitted to the Postgraduate Study Committee with the appropriate documentation prescribed by the study holder.
- The decision on the approval of continuation of the terminated study is made by the Postgraduate Study Committee, which contains the approval of the continuation of studies, recognition of exams with grades and ECTS credits during the study, and tuition fees determined according to the amount determined for the generation of students with whom the student continues one's studies.

5. CONDITIONS OF STUDY CONDUCT

5.1. Location of study programme

Faculty of Food Technology Osijek, Osijek, F. Kuhača 18 and Trg Sv. Trojstva 3

5.2. Spatial facilities for teaching

The existing premises and equipment of the Faculty of Food Technology of the Josip Juraj Strossmayer University of Osijek will be used for the study.

Table 3. Spacial facilities and personnel for teaching

1. SPACIAL FACILITIES AND EQUIPMENT

1.1. Bulidings

Code	*Location*	*Built - year*	*Reconstructed - year*	*Total space in m²*
PTFOS-1	Osijek, F. Kuhača 18	18th and 19th century	2002 – 2006	1453
PTFOS-2	Osijek, F. Kuhača 18	18th and 19th century	1995 - 2002	3120
UNIOS	Trg Svetog Trojstva 3	18th and 19th century	-	800

1.2. Lecture halls and classrooms

Building	*Lecture hall/classroom name*	*Space in m²*	*Number of seats for students*	*Hours used per week*	*Quality of fit-out* (from 1 to 5)*
PTFOS-1	Predavaonica I	83.72	121	36	4
PTFOS-1	Predavaonica II	78.12	84	31	4
PTFOS-1	Predavaonica III	64.86	70	28	3
PTFOS-1	Predavaonica IV	75.36	56	40	3
PTFOS-1	Predavaonica V	46.47	30	28	3
PTFOS-1	Računalna učionica	48.48	10	27	4
PTFOS-1	Računalna učionica	39.98	16	40	5
UNIOS	Predavaonica VII	*68*	*78*	27	4
UNIOS	Predavaonica VII	*68*	*76*	27	4

**quality of furniture, technical and other equipment*

1.3. Laboratories used for teaching

Building	*Intern mark of laboratory*	*Space (u m²)*	*Number of working places for students*	*Hours used per week*	*Quality of fit-out (od 1 do 5)*
PTFOS-1	Laboratorij I/1 S	66,12	10	60	5

PTFOS-1	Laboratorij I/2 S	63,01	10	40	5
PTFOS-1	Laboratorij I/3 S	35.58	8	45	5
PTFOS-1	Laboratorij I/4 S	46.49	12	30	4
PTFOS-1	Laboratorij II/5 S	80.53	10	60	4
PTFOS-1	Laboratorij II/6 S	75.87	10	50	3
PTFOS-1	Laboratorij II/7 S	76.24	10	40	3.5
PTFOS-2	Laboratorij III/8 S	84.55	10	40	3
PTFOS-2	Laboratorij III/9 S	46.14	20	40	2
PTFOS-2	Laboratorij III/10 S	56.86	12	30	3
PTFOS-2	Laboratorij III/11 S	39.92	8	40	4
PTFOS-2	Laboratorij III/12 S	57.15	7	40	3
PTFOS-2	Laboratorij III/13 S	37.61	7	40	3.5
PTFOS-2	Laboratorij III/14 S	37.6	10	40	5
PTFOS-2	Laboratorij III/15 S	57.14	20	30	4

1.4. Teaching bases

Mark	*Name of the institution*	*Numer of students*	*Hours of teaching*
-	-	-	-

1.5. Computer room equipment
(data for computer laboratories used for teaching)

Number of computers with less than 3 years	*Computers older than 3 years*	*Functionality (1 to 5)*	*Maintenance (1 to 5)*	*Usability beyond classes*
16	8	4	5	5

1.6. Teachers' cabinets

Building	*Number of offices*	*Average space (m^2)*	*Fit-out (1 to 5)*	*Average space in m^2 per permanent employee*
PTFOS-1	32	10	4	6.7
PTFOS-2	14	8	3	6.7
UNIOS	3	17	3	6.7

1.7. Spaces used only for scientific and professional research

Building	*Mark of laboratory*	*Space (m^2)*	*Hours used per week*	*Fit-out (1 to 5)*
Franje Kuhača 18	Laboratorij I/1 Is 31	42.37	30	3
Franje Kuhača 18	Laboratorij I/2 Is 34	30.85	30	5

Franje Kuhača 18	Laboratorij I/3 ls 41	23.86	60	4
Franje Kuhača 18	Laboratorij I/4 ls 45	29.08	40	2
Franje Kuhača 18	Laboratorij I/5 ls 46	30.1	35	4
Franje Kuhača 18	Laboratorij I/6 ls 47	28.1	20	3
Franje Kuhača 18	Laboratorij I/7 ls 52-54	66.58	25	3
Franje Kuhača 18	Laboratorij II/8 ls 61	36.02	40	4
Franje Kuhača 18	Laboratorij II/9 ls 68-69	23.25	40	4
Franje Kuhača 18	Laboratorij II/10 ls 73	28.3	40	3
Franje Kuhača 18	Laboratorij II/11 ls 74	24.61	30	3
Franje Kuhača 18	Laboratorij II/12 ls 77	54.37	40	5
Franje Kuhača 18	Laboratorij II/13 ls 84	32.36	25	3.5
Trg Svetog Trojstva 3	Laboratorij IV/14 ls	57.19	40	3

1.8. Capital equipment
(purchase value above 200 000 kunas)

Instrument (equipment)	*Purchase value*	*Years*
CHROMATOGRAPH VARIAN	299,929.16	18
ZETASIZER 2000	399,129.10	17
ELECTROPHORESIS SYSTEM	328,163.46	17
EXTRACTION SYSTEM	237,001.20	17
TEKSTURE ANALYSER	232,196.50	16
GC MS HEWELTTPAKART	369,052.89	15
API 2000 TM LC/MS/MS	1,215,736.10	14
FOOD SCAN	375,121.00	13
TEXTURE ANALYSER	225,270.00	13
PLASTOGRAPH EC PLUS	863,516.00	11
GC SYSTEM 1	441,085.06	11
SMOKING. DRYING, AND FERMENTATION OF SAUSAGES	332,766.25	8
MASS DETECTOR	249,706.25	6

GASS CHRO AGILENT 7890 GC	249,348.25	6
HPLC	503,750.00	5
HORIZONTAL BIOREACTOR	206,250.00	5
INJECTOR 1260 INFINITY II	240,000.00	3
MINI SPRAY DRYER B-290	204,330.00	2
HPLC w PREPARATIVE CHROMATOGRAPHY	502,390.70	1
HPLC w DAD DETECTOR	384,000.00	0.5
DSC CALORIMETER	242,221.24	-
POTEN/GALVANO MOD273A	225,346.87	-

1.9. LIBRARY

a) general data

Total space (m^2)	*Number of employees*	*Number of working places*	*Number of students using the library*	*is there an electronic catalogue of books and journals?*
253	2	45	800	yes

b) fit-out

Nr of book titles	*Nr of textbooks**	*Contemporarity of books and textbooks (1 - 5)*	*Nr of titles of foreign journals*	*Nr of titles of domestic journals*	*Functionality of catalogue of book and journals (od 1 do 5)*	*Fit-out (1 to 5)***	*Quality and availability of electronic materials****
3908	1714	4	85	51	5	4	4

** number of titles, regardless the number of copies.*
*** including obtaining copies for personell and students in the library and from other libraries.*
**** electronic materials include e-books, e-journals, databases, catalogues of the own and other libraries.*

1.10. Students' office

Total space (m^2)	*Number of employees*	*Working hours*
30	*2*	*8-15*

Table 4. Staff

4.1. List and work load of Faculty teachers engaged in the study	Table 4.1.
4.2. List and work load of external teaching staff engaged in the study	Table 4.2.
4.3. Analysis of programme coverage by Faculty emloyees in relation to total teaching staff needed for the study (%)	
4.4. CVs of teaching staff involved in the study[1]	

[1] **VAŽNO:** Ako nastavnik nije zaposlen u visokoobrazovnoj ustanovi koja predlaže studijski program, prilažu se sljedeće pismene izjave:
1. Izjava nastavnika da je spreman izvoditi nastavu
2. Dopuštenje čelnika ustanove u kojoj je nastavnik zaposlen s navođenjem predmeta i razdoblja za koje se dozvola izdaje.

4.5. Optimal number of students at the study, considering staff and teaching facilities	
4.6. List and qualifications of assisstants who will be engaged in teaching activities	Table 4.6.
4.7. Student:teacher ratio	

Table 4.1. List and work load of Faculty teachers engaged in the study

TEACHERS EMPLOYED AT THE FACULTY								
Scientific - educational title	Name and surname	Subject	Semester	Plan	Realization	Norm hours	Total work load at the study	Total work load at the Faculty
				P E S	P E S			
FULL PROFESSORS	Dragan Kovačević	PSS-I-02o	I.	20 5 5	14 0 0	75.6	237.6	870
		PSS-I-03o	I.	30 0 0	30 0 0	162		
	Mirela Kopjar	PSS-I-06	I.	20 0 5	20 0 5	128	128	870
	Ljiljana Primorac	PSS-I-07	I.	15 0 5	15 0 0	81	81	785.7
	Daniela Čačić Kenjerić	PSS-I-08	I.	10 0 10	10 0 10	94	94	990
	Stela Jokić	PSS-I-09	I.	10 5 10	10 5 10	107.5	107.5	687.6
	Lidija Jakobek Barron	PSS-I-12	I.	15 0 5	15 0 5	94	94	947.6
	Drago Šubarić	PSS-I-13	I.	15 2 3	10 0 0	54	54	944
	Jurislav Babić	PSS-I-19	I.	15 0 10	8 0 0	43.2	43.2	944
ASSOCIATE PROFESSORS	Đurđica Ačkar	PSS-I-1o	I.	15 0 15	15 0 15	121.5	121.5	944
	Ivana Flanjak	PSS-I-07	I.	15 0 5	0 0 5	20	121	816
		PSS-I-14	I.	15 0 5	15 0 5	101		

	Frane Čačić Kenjerić	PSS-I-10	I.	20 0 5	20 0 5	128	128	829.5
	Natalija Velić	PSS-I-11	I.	10 0 10	10 0 10	94	94	843.4
ASSISSTANT PROFESSORS	Antun Jozinović	PSS-I-13	I.	15 2 3	5 2 3	44.4	44.4	944

Table 4.2. List and work load of external teaching staff engaged in the study

Scientific-educational title	Name and surname	Subject	Semester			Plan			Realization	Norm hours
			P	V	S	P	V	S		
FULL PROFESSORS	Sunčica Oberman Peterka	PSS-I-18	20 0 10			10	0	5	148	72
	Sanja Pfeifer	PSS-I-16	15 0 5			15	0	5	101	101
	Marija Ham	PSS-I-05	16 0 4			16	0	4	102.4	102.4
ASSOCIATE PROFESSORS	Antun Biloš	PSS-I-17	20 0 0			10	0	0	108	54
	Anamarija Delić	PSS-I-18	20 0 10			10	0	5	148	72
	Julia Perić	PSS-I-19	15 0 10			7	0	0	121	40.5
	Davorin Turkalj	PSS-I-17	20 0 0			10	0	0	108	54
	Aleksandar Erceg	PSS-I-19	15 0 10			0	0	10	121	40

ASSISSTANT PROFESSORS	Ivan Kelić	PSS-I-15	15 0 10	15	0	10	121	121
dr. sc.	Jasmina Ranilović	PSS-I-04	10 0 15	10	0	15	114	114
mr. sc.	Tanja Milović	PSS-I-03o	20 5 5	6	5	5	141.5	65.90

Tablica 4.3. Analysis of programme coverage by Faculty teachers in relation to total teaching staff needed for the study (%)

PSS Innovations in Food Production	**Contact hours**			
	Lectures	**Seminars**	**Excersizes**	TOTAL
Total – compulsory courses	65	20	5	90
- *PTFOS*	*65*	*15*	*0*	*80*
Total – elective courses:	241	112	7	360
- *PTFOS:*	*135*	*58*	*7*	*200*
TOTAL	**306**	**132**	**12**	**450**
TOTAL - PTFOS	***200***	***73***	***7***	***280***
% PTFOS	***65.35***	***55.30***	***58.33***	***62.22***

PSS Innovations in Food Production	**ECTS**			
	Lectures	**Seminars**	**Excersizes**	TOTAL
Total – compulsory courses	10.83	3.33	0.88	15.04
- *PTFOS*	*10.83*	*2.49*	*0*	*13.32*
Total – elective courses:	40.15	18.65	1.16	59.96
- *PTFOS:*	*22.49*	*9.66*	*1.16*	*33.31*
TOTAL	**50.98**	**21.98**	**2.04**	**75**
TOTAL - PTFOS	***33.32***	***12.15***	***1.16***	***46.63***
% PTFOS	***65.35***	***55.30***	***58.33***	***62.22***

Number of Faculty teachers involved in the study	13

Number of external teaching staff involved in the study	11
Number of ECTS credits covered by Faculty teachers	46.63
Number of ECTS credits covered by external teaching staff	28.37
Proportion of ECTS credit coverage by Faculty teachers (%)	**62.22%**

Total working load of Faculty teachers at at the study: 62.22 %.

4.4. **CVs of teaching staff**

See appendix

Optimal number of students

Optimal number of students per year is 10, or according tro decision of Faculty Council.

Table 4.5. Student:teacher ratio

Optimal number of students	10
Number of Faculty teachers at the study	13
Student:teacher ratio	0.76:1

List and qualifications of assisstants who will be involved inn teaching activities

All teaching staff of PTFOS and external experts, according to decision of Faculty Council

5.3. The cost of studying per student

The cost of study per student is 25,000.00 kunas. Expenses of mobility are not included into tuition.

Costs of specialist thesis are not included in tuition.

5.4. Monitoring of the quality and efficiency of the study programme implementation

The procedures for carrying out certain activities related to quality monitoring, assurance and improvement shall be conducted pursuant to the applicable Rulebook for the Monitoring and Assurance of the Quality of the Higher Education at the Faculty of Food Technology Osijek. The Rulebook and other documents relating to the monitoring, assurance and improvement of the quality of the study is available on the official webpage of the Faculty:

http://www.ptfos.unios.hr/index.php/kvaliteta.

5.5. Student support

Consultations, mentoring, administrative support, students' office and Student Assembly are available to students as a part of formal education. Students are encouraged to participate in research and humanitary work, and in sport activities through formal recognition of their activity. Student Assembly and student associations have available working space, and financing of students' participation at conferences and at competitions.

Apart from education through formal study programmes, the Department of Vocational Student Guidance and other competent services provide students with the possibility of participation in various trainings.

Some of the workshops held in the previous period are as follows::

- "How to achieve a successful career" – workshop organised by PTFOS during University career week; workshop moderator Ana-Marija Cikoš, mag. ing.
- "Communication skills – nonverbal communication" – workshop organised by PTFOS, held on 16. 3. 2020; workshop leader Robert Raponja, associate prof.
- "Communication skills – nonverbal communication" – wotkshop organised by Tehnos, held 8. 4. 2019; workshop leader Robert Raponja, associate prof.
- How to research in databases and catalogues – workshop organised by Faculty library, held on 3. 12. 2018; workshop leader: Sanda Hasenay, head of library

Workshops organized by the Department of Vocational Student Guidance are held on a periodic basis.

Beside the above trainings intended specifically or primarily for students, the latter have the possibility to attend all the lectures organized by the ''Tehnos'' and ''DKT'' associations, the work of which is bound to the Faculty.

5.6. Financial evaluation

Financial plan for period 2021 – 2023 is approved by Josip Juraj Strossmayer University of Osijek and Ministry of Science and Education, and available at: odobren od strane Sveučilišta Josipa Jurja Strossmayera u Osijeku i Ministarstva znanosti i obrazovanja nalazi se na poveznici:

http://www.ptfos.unios.hr/images/dokumenti/na-razini-fakulteta/2021/08-01/ptf-financijski-plan_2021-2023--odobren.xlsx

Table 5.1. Students

	N	N+1	N+2	N+3	N+4
Total number of students	10	20			
1) full-time					
a) supported by Ministry					
b) paying tuition	10	20			
2) part-time					

Appendices:

1. CVs of teachers
2. Statements of external teachers
3. Permission of Dean of Faculty of Economy for teacher engagement in the study
4. Documents related to ownership and use of facilities
5. Accrediation certificate for pregraduate study *Food technology*
6. Accrediation certificate for graduate studies:
    a. *Food engineering;*
    b. *Process engineering*;
    c. *Food science and nutrition.*
7. Agreements (contracts) for partners beyond higher-education system:
    a. Podravka d.d.
    b. State intellectual property office
8. Opinions of three organisation regarding the learning outcomes
    a. Karolina d.d.
    b. Karlovac University of Applied Sciences
    c. Society of Chemists and Technologists Osijek

1. CVs o teachers

Dragan Kovačević, http://www.ptfos.unios.hr/index.php/component/gridbox/nastavno-osoblje-2/dragan-kovacevic-phd-full-professor

Mirela Kopjar, http://www.ptfos.unios.hr/index.php/component/gridbox/nastavno-osoblje-2/mirela-kopjar-phd-full-professor

Ljiljana Primorac, http://www.ptfos.unios.hr/index.php/component/gridbox/nastavno-osoblje-2/ljiljana-primorac-phd-full-professor

Daniela Čačić Kenjerić, http://www.ptfos.unios.hr/index.php/component/gridbox/nastavno-osoblje-2/daniela-cacic-kenjeric-phd-full-professor

Stela Jokić, http://www.ptfos.unios.hr/index.php/component/gridbox/nastavno-osoblje-2/stela-jokic-phd-full-professor

Lidija Jakobek Barron, http://www.ptfos.unios.hr/index.php/component/gridbox/nastavno-osoblje-2/lidija-jakobek-barron-phd-full-professor

Drago Šubarić, http://www.ptfos.unios.hr/index.php/component/gridbox/nastavno-osoblje-2/drago-subaric-phd-full-professor

Jurislav Babić, http://www.ptfos.unios.hr/index.php/component/gridbox/nastavno-osoblje-2/jurislav-babic-phd-full-professor

Đurđica Ačkar, http://www.ptfos.unios.hr/index.php/component/gridbox/nastavno-osoblje-2/durdica-ackar-phd-associate-professor

Ivana Flanjak, http://www.ptfos.unios.hr/index.php/component/gridbox/nastavno-osoblje-2/ivana-flanjak-phd-associate-professor

Frane Čačić Kenjerić, http://www.ptfos.unios.hr/index.php/component/gridbox/nastavno-osoblje-2/frane-cacic-kenjeric-phd-assistant-professor

Natalija Velić, http://www.ptfos.unios.hr/index.php/component/gridbox/nastavno-osoblje-2/natalija-velic-phd-associate-professor

Antun Jozinović, http://www.ptfos.unios.hr/index.php/component/gridbox/nastavno-osoblje-2/antun-jozinovic-phd-assistant-professor

Sunčica Oberman Peterka, http://www.efos.unios.hr/speterka/en

Sanja Pfeifer, http://www.efos.unios.hr/spfeifer/en

Marija Ham, http://www.efos.unios.hr/mham/en

Antun Biloš, http://www.efos.unios.hr/abilos/en

Anamarija Delić, http://www.efos.unios.hr/adelic/en

Julia Perić, http://www.efos.unios.hr/jperic/en

Davorin Turkalj, http://www.efos.unios.hr/dturkalj

Aleksandar Erceg, http://www.efos.unios.hr/aleksandarerceg

Ivan Kelić, http://www.efos.unios.hr/ikelic/en

Jasmina Ranilović,

Tanja Milović