



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

Kauno technologijos universiteto  
***MAISTO PRODUKTŲ TECHNOLOGIJOS PROGRAMOS***  
**(621E40002, 62405T106)**  
**VERTINIMO IŠVADOS**

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**EVALUATION REPORT**  
***OF FOOD PRODUCTS TECHNOLOGY (621E40002,***  
***62405T106)***  
**STUDY PROGRAMME**  
at Kaunas University of Technology

Grupės vadovas:  
Team Leader:

Prof. Indrikis Muiznieks

Grupės nariai:  
Team members:

Prof. Frank McMahon

Prof. Marek Frankowicz

Prof. Vieno Irene Piironen

Doc. dr. Ingrida Bružaitė

Eglė Dilkienė

Tadas Juknius

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## DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Maisto produktų technologija</i>
Valstybinis kodas	621E40002, 62405T106
Studijų sritis	Technologijos mokslai
Studijų kryptis	Maisto technologijos
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	antroji
Studijų forma (trukmė metais)	Nuolatinė (1,5)
Studijų programos apimtis kreditais	90
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Maisto technologijų magistras
Studijų programos įregistravimo data	2001-10-24, įregistruota Senato sprendimu Nr.0-87.

## INFORMATION ON ASSESSED STUDY PROGRAMME

Name of the study programme	<i>Food products technology</i>
State code	621E40002, 62405T106
Study area	Technological Sciences
Study field	Food Technology
Kind of the study programme	University studies
Level of studies	second
Study mode (length in years)	Full-time (1,5)
Scope of the study programme in credits	90
Degree and (or) professional qualifications awarded	Master of Food Technology
Date of registration of the study programme	October 24, 2001 established by the decision of the Senate No.0-87.

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## I. INTRODUCTION

### *Programme evaluated*

Kaunas University of Technology (hereinafter – KTU) is one of the largest technical universities in the Baltic States. KTU offers six main fields of study: technological, physical and social sciences, arts, humanities and biomedicine. Currently KTU is successfully moving forward to become the University of Science and Innovations, which would provide effective cooperation among the studies, science and business. The mission of KTU is to provide a research based studies at international level; to create and transfer knowledge and innovative technologies for sustainable development and innovative growth of the country; to provide an open creative environment that inspires leaders and talented individuals.

At KTU in the year 2012 there are almost 10 000 undergraduate and almost 3 000 graduate students. The university employs almost 3000 people. Academic staff consists of 1266 employees: 1045 teachers (118 professors and 354 associate professors) 106 research fellows, 116 visiting teachers. 11 faculties of KTU are located in Kaunas and two in Panevėžys.

KTU is the only higher school in Lithuania to train all level university education specialists for the food industry, catering services and other areas related to the creation of new technologies and research in food processing.

The second cycle Food Product Technology study programme (hereinafter – FPT SP) is run by the Chemical Technology Faculty which houses the department of Food Product Technology. Other departments of this faculty are also involved in the programme.

The FPT SP was established on 24.10.2001 by the decision of the Senate and is a continuation of the programme “Food Products Technology” which existed at the KTU since the year 1951.

### *Evaluation Team*

The chairman of the team: Prof. Indrikis Muiznieks, Dr.habil.Biol., Vice-Rector of the University of Latvia, Latvia; team members: Professor in Food Chemistry Vieno Irene Piironen, PhD, University of Helsinki, Finland; Professor Frank McMahan, Emeritus Director of Academic Affairs, Dublin Institute of Technology, Ireland; Professor Marek Frankowicz, Dr.habil.Chem., Jagiellonian University, Krakow, Poland; Dr. Ingrida Bružaitė, Assoc.Professor of the Vilnius Gediminas Technical University, Lithuania, employers representative Mrs. Eglė Dilkienė, Executive Director of the Lithuanian Association of Hotels and Restaurants; student Mr. Tadas Juknius, University of Health Sciences, Kaunas, Lithuania.

### *The procedure of the evaluation*

The Self Evaluation Report (hereinafter – SER) of the KTU FT SP was made available to the expert team in July 2012. All the members of the expert team examined the SER individually, preparing preliminary reports and indicating problem questions or discussion points. The experts obtained further information during the site visit in Kaunas on October 23 through interviews with Programme co-ordinators, Department heads, senior and junior members of the teaching staff, students, graduates and employers. After the visit, on October 27 the expert group held a meeting, discussed the contents of the evaluation report and agreed upon the numerical evaluation of every paragraph of the evaluation. The draft report was composed through electronic exchange of opinions within the expert team and forwarded to KTU. After receipt of the comments from the KTU the expert team members prepared final version of their reports, which were integrated into one document by the chairman of the team.

## II. PROGRAMME ANALYSIS

### *1. Programme aims and learning outcomes*

The food industry has always been one of the main areas of Lithuania's economy. Between 2002 and 2008 food industry was characterised by a rapid process of re-structuring, when the number of total food enterprises halved and the comparative role of big enterprises rose. The fall in the food sector during the world financial and economic crisis of 2008-2009, however, was not as dramatic as the country's average. The investment in modernization and increased productivity as well as quality improvement created preconditions for sustainable growth and overcoming the negative effects of the crisis.

In 2010, on realizing the EU-funded project "Development of professional and practical skills and enterprise of students in the imitation enterprises of processing industry", the questionnaire survey on the evaluation of the desired general and special competences of specialists of different positions in food business industry was carried out. The majority of respondents pointed out that special knowledge and abilities, awareness of technologies, manufacturing and service areas are of greatest importance. These suggestions were taken into account at the subsequent remodelling of the FPT SP. The demand for FPT SP graduates is illustrated by the fact that food sector enterprises have established target scholarships for the students of the programme.

The aim of the FPT SP is to train specialists who are skilled in different food technologies and are aware of the principles of new product creation, the systems of food safety and quality management, capable of designing, creating, implementing and managing production processes, formulating tasks for product development and quality control and practically implementing them on the basis of modern achievements in food engineering and technology.

Food technology studies at the Masters level are offered only by KTU. The Veterinary Academy of the University of Health Sciences in Kaunas provides the study programme "Veterinary Food Safety", which leads to the Master's degree in Public Health. This programme is of a narrower profile (veterinary food safety) and differs from that of FPT SP in its content and aims. The Department of Food Technology at KTU provides also one other second cycle programme "Food science and safety", which is related to food technology, but was not the subject of analysis during this evaluation.

Learning outcomes are used in the design of the programme and are clearly specified and harmonised with study programme aims; they are achieved by teaching specific subject modules included in the curriculum. The expected learning outcomes are coherent with the qualifications that signify completion of the second cycle. The learning outcomes of the FPT SP are defined in line with the principles of international recommendations<sup>1</sup> and in compliance with national regulations<sup>2</sup>. They constitute the aggregate of five categories: (1) knowledge and its application; (2) research skills; (3) subject-specific skills; (4) social skills; (5) personal skills. Each category is subdivided into outcome groups, numbering from two (research, social and personal skills) up to six (knowledge and its application).

Research and subject-specific skills that may be regarded as related to Catering Technology specialization, which is a part of FPT SP are missing among the descriptions of the programme outcomes. Meanwhile, the study outcome A5 cannot be attributed to the entire programme in general; it is more specific to the Catering Technology specialization. Study aims should be clearly defined also on the information for the FPT SP, which is available on the KTU website. The SER should give details of the objectives and outcomes that are common and what are specific for two study specialisations (Technology and Catering) and how are they

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<sup>1</sup> Dublin Descriptors, 2004; European Qualifications Framework for Lifelong Learning

<sup>2</sup> Order of the Minister of Education and Science of the Republic of Lithuania On Approval of the Descriptor of Study Cycles, 21 November, 2011 No. V-2212

interrelated with another Master's level programme provided by KTU "Food Science and Safety".

Comprehensive information on the programme and the admission rules are publicized in the university website (<http://www.ktu.lt/priemimas>) and in the annual publication "KTU study programmes". The information on the Internet is available in Lithuanian and in English.

The second cycle study programme Food Products Technology leads to the qualification Master of Food Technology on basis of acquisition of the learning outcomes that are compatible with the qualification offered. The name of the FPT SP, its learning outcomes, content and the qualifications offered are compatible with each other. Although Catering Technology, which is one of the specialization tracks in the programme, is assigned to the area of services in Lithuanian Study Programme Register, it is clearly related to food technology and fundamental subjects of chemical engineering, which are provided in FPT SP.

The conferred degree is expected to grant the possibility of seeking doctoral degree in the KTU or in other universities, but it should be specified to which institutions and which programmes are the graduates eligible and what bridging requirements they may meet when applying for further studies.

## ***2. Curriculum design***

The curriculum design meets the legal requirements for Master's studies programmes according to Lithuanian national regulations in semesters and in the volume of the programme (90 ECTS, duration 1,5 years; requirement 90-120 ECTS) and in the volume of subjects of the study field (60 ECTS including specialization alternatives of 19 ECTS; requirement not less than 60 ECTS). Their level is according to the legal requirement. The programme is composed of modules (3-9 ECTS) and number of modules is at maximum 5 in each semester (requirement not more than 5 subjects during one semester). The curriculum has two elective specializations of 19 ECTS. In the Food Technology specialization, 9 ECTS of studies can be further opted (a list of 8 elective modules is given). In the Catering Technology and Organization specialization all the modules are the same for all the students. The volume of elective studies is thus less than 30 ECTS and fulfils the requirement.

The volume of the Final Degree Project is 30 ECTS (requirement: no less than 30) and the Degree Projects are based on independent applied research. The volume of independent work is clearly more than 30% of the volume of each module (requirement not less than 30% of the volume of every study subject).

The subjects are organized evenly over the study semesters, 30 ECTS in each semester. Each module has a clearly different theme and the themes are thus not repetitive. Themes of the obligatory modules are relevant and they are covering important areas. Link of each module with the learning outcomes has been considered and clearly reflected in the module description. All learning outcomes are well-covered. The order of the modules within the study plan is appropriate and clear.

The volume of some modules is small (3 – 4,5 ECTS). However, the module structure is clear and gives quite a clear overall description of the programme. There is a separate 3 ECTS module on food additives but not for other food components and their role in technology development. Eventual merging of this module with the "Food Quality and Safety Management" may be considered. Unlike the description of other modules, which give thorough information about the study topics, outcomes and assessment, the description of the modules for the Research Project and Final Degree Project do not provide general outline of the expected structure of the deliverables. In case of the Final Degree Project it may be assumed that an explicit description about its structure, content and evaluation criteria is available in Lithuanian (guidelines brochure for the students of Chemical Technology, 104 pp.). Meanwhile no indications about availability of such a supporting material are given in the Research Project module description.

The references given in the module descriptions are partly not updated. For example, in the Food Additive module the newest reference is from 2005 and several references are from

1990's. In the Automatic Designing and Optimization module the newest reference is from 1999, the New Product Development module references are mostly from 2000-2005; the Technological Process Control module, references from the years 1981, 1988, 1993, 1999, 2002; the Fat Science and Processing module – references from the period 1998-2004. The Evaluation Team believes that the contents of the modules are more updated than the main references.

During the first semester the Research Project students take modules of engineering economics, food quality and safety management, food additives as well as specialization modules (13 ECTS). In the second semester obligatory modules on new food products development, fundamentals of food factories design and construction and one specialization module are studied. During the third semester the Final Degree Project work is carried out. The content of the modules is appropriate when compared with the aim of the programme (the SER, paragraph 27). They focus on different food technologies and knowledge (food safety, quality management, etc.), which is needed in new product development.

The course themes are application based or commodity based. This requires that more general and comprehensive knowledge of food processing techniques and food chemistry, biochemistry and microbiology has been obtained in bachelor level. Information on the structure of the Bachelor of Food Technology at KTU, which other first cycle degrees are accepted and how they are supplemented by bridging studies would have helped in overall evaluation of the curriculum. The Evaluation Team is ready to assume that an appropriate knowledge base is attained within the first cycle Food Technology studies at the KTU, which were not addressed in this round of evaluation; meanwhile the Professional Bachelor Studies at the College level, whose programmes were assessed, do not provide the needed learning outcomes for the immediate further studies in the FPT SP at KTU.

Teaching methods include lectures, practicals, laboratory work, and individual work. Most modules include both lectures and practicals/laboratory work. The ratio of lectures, practicals and laboratory work and independent study is good.

Various individual study methods are used to foster student-centred work, e.g., colloquium, reporting on laboratory work, exam, project, homework, control work, paper, sectional work, oral presentation, laboratory notes and report.

The scope of the programme is sufficient to ensure the learning outcomes within the given time-frame. As a Master's degree programme the FPT SP focuses on high level applied research based topics and aims to train leading food technology specialists. The achievements in science are taken into account in a relevant way.

### **3. Staff**

FPT SP is delivered by 4 professors, 11 assoc. professors and 3 lecturers. The academic experience of professors and assoc. professors exceeds 10 years' period. All the professors involved in the programme participate also in the Doctoral studies at the KTU.

According to legal regulations, at Masters Study level at least 20 percent of the volume of the major study field subjects should be delivered by professors. The regulation is fulfilled, since 22 % of the subject volume in ECTS is delivered by professors.

The education of the teachers and their areas of research as well as academic experience, ability to efficiently communicate in English or German, preparation and initiative to apply effective teaching methods, productivity of research and ability to advise students in planning their carrier, secure achieving the programme aims and objectives. The information on the qualification of the academic staff provided in the SER proves the compliance of their qualification with the State requirements. Researchers and Doctoral students also actively participate in the study process. They conduct laboratory tests and practice.

The turnover of teaching staff ensures an adequate provision of the programme. Since 2007 six new staff members have been engaged in the teaching, among them one professor and three associate professors, two staff members have retired during this period. At present the motivation of the universities staff remains high; therefore the main causes for the turnover of

the teachers are either the promotion to higher positions or the retirement, or maternity leave. Cases of changing job affiliation are rare. The current list of personnel shows the balanced age structure of the staff; average age is close to 50.

The academic staff of the FPT SP has to be commended for very successful research activity and intensive international mobility, which is supporting modernization of the education. The teachers of food technology area publish on average 50 scientific papers a year, out of which 10-12 are in the category of ISI Web of Science publications, also in the leading international journals of the Food Science & Technology subject category. The teachers participate in international scientific conferences in Lithuania and abroad. Their scientific activity corresponds to the delivered subject.

International research placements, participation in international workshops and conferences are the main instruments in improving the qualifications of the academic staff. At the KTU the teachers have the opportunity to improve their qualification at the Centre of Distance Learning, which provides lecture cycles on the presentation of teaching material in virtual environment, on new interactive methods of surveys and testing, e.g., Moodle, on the visualization of demonstration material. The lecture cycles for teachers willing to improve their educational competence are delivered annually. The Evaluation Team wants to encourage further exploring of the options provided for introducing new teaching methods in Moodle environment since the first experience of its implementation apparently has not created huge enthusiasm among FPT SP staff.

Research and teaching quality of the academic staff is addressed by regular assessments, which take place once in 5 years. During the period being evaluated all the permanently employed teachers of the FPT SP were successfully assessed, most of them being recognized as having exceeded the minimal qualification requirements. The number of the staff is adequate to provide the expected learning outcomes, also to secure the research-based studies in all the food technology specialization tracks (meat, milk, grain, fish, fermentation, fruit, fat, sugar & starch) and catering technologies. The functionality of laboratory equipment and teaching aids is ensured by the technical support personnel: two laboratory supervisors, one senior laboratory assistant and one engineer.

#### ***4. Facilities and learning resources***

Financial resources of KTU compared to the budgets of European universities are poor, but the KTU has to be commended for its activities to attract funding from third parties through research and service contracts. In comparison to the other universities, the KTU is very efficient in obtaining contracts with different enterprises, for educational services delivered, from international projects and foundations.

The Food Technology Department has sufficient number of classes for the implementation of the modules of the FPT SP. The technical and sanitary state of the classes is very good.

The Food Technology Department at KTU has Chromatography, Food Reology and Structure, Mass Spectrometry laboratory, Food Chemistry and Analysis, Biochemistry, Extraction, Grains and grains products laboratories. The availability, versatility and modern equipment within the Food Technology Department ensure teaching efficiency of FPT programme. The Competence Centre for Food Science and Technologies was opened at the end of 2010 within the premises of FC SP. The Centre is exceptional for its food engineering, and technology and quality analysis research equipment concentrated in one place. The equipment is designed to model, optimize and test the manufacture and storage processes of food products. Small capacity technological lines for the production of bread, meat, fish, milk, beer, are available here to simulate and model technological processes.

The improvements in lab safety and environment protection procedures, e.g., the disposal of chemical waste, availability of the first aid kits, should be considered to ensure the

development of the relevant skills and working practices among the students, which will be demanded at organizing the production processes in industry.

The computer classes and library are sufficiently equipped with a cable and wireless internet access, computers, video and audio equipment. The library was renovated three years ago, it has 174 workplaces; out of them 34 computerized workplaces for the search of electronic literature. The stock of books, textbooks and periodical publications for implementation of FPT SP is regularly supplied by the latest literature. The teaching and scientific literature is adequate and accessible. The FPT SP students use the publications kept at the Central Library, in its branch, at the Chemical Technology Faculty, and in the Food Products Technology Department. The students can work individually in the renovated computer classrooms (55 work stations). The students can make use of the reading room of the KTU Central Library, which has 174 work stations (including 32 computerized places). The subject module descriptions include the list of literature and the number of copies of the mentioned titles in the Library of the KTU. The teachers and students can get access to the on-line catalogue data bases (54 subscription data bases) in their working rooms at the university or at home. A number of text books and study materials are published by the FPT SP teachers also in Lithuanian. The students expressed interest in having access to more electronic books.

The teaching and learning equipment (laboratory and computer equipment, consumables) are adequate both in size and quality to provide Master's study programme in Food Products Technology.

### ***5. Study process and student assessment***

Only high motivated, interested in science and research, students are welcome for studies in this programme. Students are admitted to FPT programme depending on the quota. The applicants to Master studies in FPT SP can be persons having a Bachelor's degree in food technologies. The admission is carried out by competition according to the competition score which is formed from the first stage grades weighted average multiplied by coefficient 0,8 and from the assessment of scientific activity (expert evaluation) in the ten-grade system multiplied by coefficient 0,2. Apparently the Food Science Bachelor programme at the KTU is the only one in Lithuania whose graduates can immediately proceed to the Masters level. In seeking to attract prospective students for Master's programme, the students are acquainted with the scientific activity of the department in the first year of the Bachelor's Studies. The more capable Bachelor's students are involved in research in the 2nd or 3rd years; they are encouraged to write papers for student conferences. The practice shows that such students are successful in Master Studies.

The graduates from the Professional Bachelor studies in Food Technology or Safety at a number of Lithuanian colleges are expected to complete additional bridging courses to qualify for the further Master's studies. According to the national legislation, the length of bridging studies should not exceed one year, if the student does not change the field of studies. Nevertheless, the information, which is available at the KTU website only in Lithuanian indicates<sup>3</sup> that at least 90 ECTS or three semester long studies are demanded to cover the gap. There are very few graduates from college Professional Bachelor programmes who continue studies at Masters Level at the KTU. The demand for the extensive bridging studies may be one of the reasons for this isolation.

During the previous five years 110 students were enrolled in FPT SP at the KTU, 64 have completed the programme successfully, 17 are still learning, which gives an actual dropout rate ca. 24%. The wastage of students takes place mostly at the beginning of studies. Main reason for the study interruption is the possibility to get a job position, which is not compatible with the studies. The demand for specialists of food technology is high. At present efforts are taken to concentrate laboratory works and practices in three weekdays, so that Master students,

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<sup>3</sup> [http://ktu.lt/sites/default/files/bylos/Stojantiesiems/papildomosios\\_studijos/chemijos\\_inzinerija\\_koleg\\_nauji\\_kreditai.pdf](http://ktu.lt/sites/default/files/bylos/Stojantiesiems/papildomosios_studijos/chemijos_inzinerija_koleg_nauji_kreditai.pdf)

who have jobs, can combine work and studies. The efforts to reduce the number of dropout are taken also by offering the possibility to study according to the individual plan or by supplying additional methodological materials, individual consultations, etc.

The studies are organized as 16-week long spring and autumn semesters, according to the schedule publicized in the University website. The examinations are taken during the 4-week examination session.

The students prepare their Master's Degree Project works by participating in the Departments' research. They take part in the exhibition "Technorama", held by young scientists, write scientific papers and read them at the traditional students' conference "Chemistry and chemical technology".

There are a lot of ERASMUS programmes for students and lectures, they have all possibilities to participate in various activities and have possibility to increase their knowledge in food technology. Seeking to facilitate the students' mobility, the Faculty organizes annual information event for students interested in ERASMUS programme studies. KTU cooperates with the BEST (Board of European Students of Technology) organization.

KTU has a very active staff mobility programme with Austria, France, Denmark, Poland and Turkey but no student has undertaken ERASMUS mobility programme. It attributes this to the short duration of the programme (1,5 years) and the fact that students are reluctant to give up their part-time jobs. A target of 20 % of all students to have completed part or all of their studies abroad has been set for 2020 by Bologna Process. It will not be easy to meet this goal for the FPT SP at the KTU.

Scholarships are available only for the very best students. The average mark of the last session should be at least 9 points from 10 or the student should be active in social life and research.

The Office of Students' Affairs in close cooperation with the Dean's Office and Student Representation of the Faculty care for the students' sport, culture activities and social life. The students have the opportunity to take part in the activities of 20 sport teams and in 15 amateur art groups. The Centre of Physical Culture and Sport coordinates sport and health programs, ensures training and participation in sport competitions. Psychological assistance is the responsibility of the KTU Centre for Academic Advance. It provides the University students with individual psychological consultations and practical group exercise classes.

During the period of studies the non-residents of Kaunas are offered the opportunity to live in the University dormitories.

The process of study result assessment is transparent and well defined. The criteria of assessment are available at the study module descriptions and they are publicized at the start of the semester. The assessment of students' knowledge, abilities and skills is carried out by means of the ten-point system and the cumulative marking scheme, which includes colloquiums, seminars, group works, individual tasks and aims at stimulating good academic performance throughout the semester, not only during the sessions. If the student fails, he/she has an opportunity to retake exam twice until the end of the first week of the following semester.

The feedback of the students' achievements is secured by announcing the results of the assessment of individual tasks and written examinations accompanied by the lecturer's oral explanation of the assessment.

The KTU Career Center organizes „Career Days“ for students and employers. During the annual “Career days” the members of the Department introduce the students to potential employers and their job offers.

Out of 62 percent of programme graduates who took part in the survey 83% are currently employed at the enterprises or public institutions according to the programme's purpose.

## ***6. Programme management***

The management of the programme is realized in accordance with the KTU statute and the University academic regulation approved by the decision of the KTU Senate. The FPT SP

run by Chemical Technology Faculty is updated and improved by the Study Programme Committee (SPC) which is a permanently operating unit approved by Rector's order.

The assessment of the programme's quality is carried out in accordance with the Internal Quality Assurance System (hereinafter – IQAS) approved by the Senate. The operation of the IQAS comprises the sub-fields of the management's responsibilities: the support for students, infrastructure and human resources, study management, research activity. Monitoring, analysis and programme improvement processes is carried out according to the approved normative documents of the KTU. The process of programme's administration and quality assurance is reflected in the academic information system, in the ORACLE media, which ensures sustainable management of study affairs.

The communication between lecturers and students is friendly and democratic; teachers are open for discussions and consultations. The survey results show that the students are happy with the performance of the teachers. They can express their criticism at the round-table discussions organized by the Faculty of Chemical Technology, whereby the students together with the teachers discuss the study quality.

In seeking the feedback from the students at the end of every semester the student survey on the quality of subjects delivered takes place. The survey is organized by the offices of Study and Information Systems. The obtained data are used by the SPC for the assessment of the modules, by the Assessment Commission, the Faculty administration and by the Student Representation. Summarized statistics of the survey is publicized. The dynamics of study failures and wastage of the students who have chosen the FPT SP is constantly analysed and evaluated.

According to the data of the recent surveys, the students evaluate positively the didactics system, cooperation between teachers and students, their possibilities to influence the quality of the study process.

Social partners, i.e. graduates of the University and employers also take part in the programme quality assessment and participate in the Master Degree Project defense committees. Twice a year representatives from industrial enterprises come to evaluate practical skills of the students.

Positive changes in the improvement of study quality have also been stimulated by social partners with whom the University signed the cooperation agreements, which were suggested by the Food Technology Department.

More detailed description of the cooperation practices and the level of formalization of the contacts of the SPC with the Faculty Council and with the study groups could give deeper insight into the functioning of IQAS within FPT SP. The quality assurance measures should be used to assist the strategic development of the curriculum according to the needs of a changing world, e.g., introduction of new approaches into the teaching process and changes in curriculum structure.

### III. RECOMMENDATIONS

Having regard to the goals of the development of the Masters Study Programme in Food Products Technology at the KTU towards national and international recognition, the expert team would like to recommend the SPC, the SER preparation team and the administration of the KTU to consider the following activities:

1. to consider designing more individualized, specific objectives and outcomes for two main study specialisation directions (Technology and Catering) within the FPT SP and providing the information on how these objectives and outcomes are interrelated with another Master's level programme provided by KTU "Food Science and Safety";
2. to explore, eventually in cooperation with the college representatives, if it is possible to shorten the bridging study period from Professional Bachelor to Master studies in

- Food Technology so that the study quality and expected learning outcomes at Master's Level are not compromised, but the national regulations on the study period length are met;
3. to provide one or two examples of the programmes where the graduates from FPT SP would be eligible for doctoral studies and what bridging requirements they may meet when applying since the conferred Masters degree at the KTU has to grant further possibilities of studies in third cycle doctoral degree programmes also in the other universities;
  4. to explore possibilities and need to introduce elective study modules in Catering Technology and Organization specialization as there are no elective studies;
  5. to provide more specific description of the expected learning outcomes for Research Project Final Degree Project within the subject module syllabi;
  6. to streamline the study process through exploring the possibilities of merging some of the smaller study subject modules into larger ones;
  7. to elaborate on modernisation of study references in the study module descriptions, including recent literature and electronic media resources, to promote use of Moodle platform in diversifying study methods;
  8. to improve the laboratory safety and environment protection procedures, e.g., as regards the disposal of chemical waste and availability of first aid kits, bringing them in full compliance with national and international regulations;
  9. to seek for the possibilities of the involvement of the students into international exchange programmes, eventually having focus on elaboration of Final Degree Project in partner universities;
  10. to diversify the quality assurance system tools supporting innovation and development of the study programme according to the changing needs of labour market in food processing technologies;
  11. to consider changing the name of the study programme from the traditional, but somehow outdated and clumsy "Food Product Technology" to shorter and more comprehensive "Food Technology", which better reflects the scope and contents of the studies.

#### IV. SUMMARY

Food technology studies at the Masters level in Lithuania are offered only by KTU. The aim of the FPT SP is to train specialists who are skilled in different food technologies and are aware of the principles of new product creation, the systems of food safety and quality management, capable of designing, creating, implementing and managing production processes, formulating tasks for product development and quality control and practically implementing them on the basis of modern achievements in food engineering and technology.

The expected learning outcomes are coherent to the qualifications that signify completion of the second cycle. The details should be welcomed on what objectives and outcomes are common and what are specific for two study specialisations Technology and Catering within FPT SP and how are they interrelated with another Master's level programme provided by KTU "Food Science and Safety". The name of the FPT SP, its learning outcomes, content and the qualifications offered are compatible with each other.

The conferred degree is expected to grant the possibility of seeking doctoral degree in the KTU or in other universities, but it should be specified to which institutions and which programmes are the graduates eligible and what bridging requirements they may meet when applying for further studies.

The curriculum design of FPT SP meets the legal requirements for the Master's studies programme according to Lithuanian national regulations in semesters and in the volume of the programme. The programme is composed of modules (3-9 ECTS). The curriculum has two elective specializations of 19 ECTS. In the Food Technology specialization, 9 ECTS of studies can be further opted in 8 commodity areas (meat, milk, grain, fish, fermentation, fruit, fat, sugar & starch). In the Catering Technology and Organization specialization all the modules are the same for all the students. 30 ECTS Degree Projects are based on independent applied research.

The link of each module with the learning outcomes has been considered and clearly reflected in the module description. All learning outcomes are well-covered. The order of the modules within the study plan is appropriate and clear. The references given in the module descriptions are partly not updated. The Evaluation Team believes that the contents of the modules are more updated than the main references. The study modules within FPT SP are commodity based and require that more general and comprehensive knowledge on food processing techniques and food chemistry, biochemistry and microbiology has been obtained in bachelor level. The Evaluation Team is ready to assume that appropriate knowledge base is attained within the first cycle Food Technology studies at the KTU, which were not addressed in this round of evaluation; meanwhile the Professional Bachelor Studies at the College level, whose programmes were assessed, do not provide the needed learning outcomes for the immediate further studies in the FPT SP at KTU.

The scope of the programme is sufficient to ensure the learning outcomes within the given time-frame. As a Master's degree programme the FPT SP focuses on high level applied research based topics and aims to train leading food technology specialists. The achievements in science are taken into account in a relevant way.

FPT SP is delivered by 4 professors, 11 assoc. professors and 3 lecturers. The academic experience of professors and assoc. professors exceeds the required 10 years' period. The academic staff of the FPT SP has to be commended for very successful research activity and intensive international mobility, which is supporting modernization of the education. The teachers of food technology area publish on average 50 scientific papers a year, out of which 10-12 are in the category of ISI Web of Science publications, also in the leading international journals of the Food Science & Technology subject category. The number of the staff is adequate to provide the expected learning outcomes, also to secure the research-based studies in all the food technology specialization tracks.

The Food Technology Department has sufficient number of classes for the implementation of the modules of the FPT SP. The Food Technology Department at KTU has

Chromatography, Food Reology and Structure, Mass Spectrometry laboratory, Food Chemistry and Analysis, Biochemistry, Extraction, Grains and grains products laboratories. The availability, versatility and modern equipment within the Food Technology Department ensure teaching efficiency of FPT program. Small capacity technological lines for the production of bread, meat, fish, milk, beer, are available here to simulate and model technological processes.

The teaching and learning equipment (laboratory and computer equipment, consumables) are adequate both in size and quality to provide Master's study programme in Food Products Technology.

Apparently the Food Science Bachelor programme at the KTU is the only one in Lithuania whose graduates can immediately proceed to the Masters level.

During the previous five years 110 students were enrolled in FPT SP at the KTU, 64 have completed the programme successfully, 17 are still learning, what gives actual dropout rate ca. 24%. At present efforts are taken to concentrate laboratory works and practices in three weekdays, so that Master students, who have jobs, can combine work and studies. The efforts to reduce the number of dropout are taken also by offering the possibility to study according to the individual plan or by supplying additional methodological materials, individual consultations, etc. The process of study result assessment is transparent and well defined.

No student from FPT SP has undertaken ERASMUS mobility program. It attributes this to the short duration of the programme (1,5 years) and the fact that students are reluctant to give up their part-time jobs.

The KTU student and administration institutions take care for the students' sport, culture activities and social life. The assessment of students' knowledge, abilities and skills includes colloquiums, seminars, group works, individual tasks and aims at stimulating good academic performance throughout the semester, not only during the sessions. Out of 62 percent of programme graduates who took part in the survey 83% are currently employed at the enterprises or public institutions according to the program's purpose.

The FPT SP run by Chemical Technology Faculty is updated and improved by the SPC, which is a permanently operating unit approved by Rector's order. The communication between lecturers and students is friendly and democratic; teachers are open for discussions and consultations. The survey results show that the students are happy with the performance of the teachers.

Social partners, i.e. graduates of the University and employers also take part in the programme quality assessment and participate in the Master Degree Project defence committees. The quality assurance measures should be used to assist the strategic development of the curriculum according to the needs of a changing world, e.g., introduction of new approaches into the teaching process and changes in curriculum structure.

## V. GENERAL ASSESSMENT

The study programme *Food products technology* (state code – 621E40002, 62405T106) at Kaunas University of Technology is given **positive** evaluation.

*Study programme assessment in points by fields of assessment.*

No.	Evaluation Area	Evaluation Area in Points*
1.	Programme aims and learning outcomes	3
2.	Curriculum design	3
3.	Staff	4
4.	Material resources	4
5.	Study process and assessment (student admission, study process student support, achievement assessment)	3
6.	Programme management (programme administration, internal quality assurance)	3
	<b>Total:</b>	<b>20</b>

\*1 (unsatisfactory) - there are essential shortcomings that must be eliminated;

2 (satisfactory) - meets the established minimum requirements, needs improvement;

3 (good) - the field develops systematically, has distinctive features;

4 (very good) - the field is exceptionally good.

Grupēs vadovas:  
Team Leader:

Prof. Indrikis Muiznieks

Grupēs nariai:  
Team members:

Prof. Frank McMahon

Prof. Marek Frankowicz

Prof. Vieno Irene Piironen

Doc. dr. Ingrida Bružaitė

Eglė Dilkienė

Tadas Juknius

<...>

## V. APIBENDRINAMASIS ĮVERTINIMAS

Kauno technologijos universiteto studijų programa *Maisto produktų technologija* (valstybinis kodas – 621E40002) vertinama **teigiamai**.

Eil. Nr.	Vertinimo sritis	Srities įvertinimas, balais*
1.	Programos tikslai ir numatomi studijų rezultatai	3
2.	Programos sandara	3
3.	Personalas	4
4.	Materialieji ištekliai	4
5.	Studijų eiga ir jos vertinimas	3
6.	Programos vadyba	3
	<b>Iš viso:</b>	<b>20</b>

\* 1 - Nepatenkinamai (yra esminių trūkumų, kuriuos būtina pašalinti)

2 - Patenkinamai (tenkina minimalius reikalavimus, reikia tobulinti)

3 - Gerai (sistemiškai plėtojama sritis, turi savitų bruožų)

4 - Labai gerai (sritis yra išskirtinė)

## IV. SANTRAUKA

Lietuvoje maisto technologijos magistrantūros studijas siūlo tik Kauno technologijos universitetas. Studijų programos *Maisto produktų technologija* tikslas – rengti specialistus, turinčius įgūdžių įvairiose maisto technologijose ir susipažinusius su naujų produktų kūrimo principais, maisto saugos ir kokybės valdymo sistemomis, sugebančiais projektuoti, įgyvendinti ir valdyti gamybos procesus, formuluoti su produktų kūrimu ir kokybės kontrole susijusias užduotis ir praktiškai jas įgyvendinti remiantis naujausiais pasiekimais maisto inžinerijos bei technologijos srityje.

Numatomi studijų rezultatai susiję su kvalifikacijomis, kurios įgyjamos užbaigus antrąją pakopą. Būtų gerai išsamiau nurodyti, kokie abiejų Maisto produktų technologijos programos specializacijų (technologijos ir maitinimo) tikslai ir rezultatai yra bendrieji ir kokie specialieji ir kaip jie susiję su kita KTU teikiama magistrantūros programa „Maisto mokslas ir sauga“. Maisto produktų technologijos studijų programos pavadinimas, studijų rezultatai, turinys ir siūloma kvalifikacija dera tarpusavyje.

Tikimasi, kad suteiktas laipsnis suteiks galimybę siekti daktaro laipsnio KTU arba kituose universitetuose, bet reikėtų nurodyti, kokiose institucijose ir kokiose programose absolventai turi teisę mokytis ir kokius papildomus reikalavimus jie turi atitikti teikdami prašymus dėl tolesnių studijų.

Studijų programos Maisto produktų technologija sandara semestrų ir programos apimties atžvilgiu atitinka Lietuvos nacionaliniuose teisės aktuose magistrantūros programoms nustatytus reikalavimus. Programa sudaryta iš modulių (3–9 ECTS kreditai). Studijų programoje galimos dvi pasirenkamosios specializacijos po 19 ECTS kreditų. 9 ECTS kreditai suteikiami už maisto technologijos specializacijos studijas vėliau gali būti panaudoti 8 produktų srityse (mėsos, pieno, grūdų, žuvies, fermentavimo, vaisių, riebalų, cukraus ir krakmolo). Visiems maitinimo technologijų ir organizavimo specializacijos studentams moduliai yra tie patys. 30 ECTS kreditų skiriama baigiamajam darbui, kuris remiasi savarankiškais taikomaisiais moksliniais tyrimais.

Kiekvieno modulio ryšys su studijų rezultatais apgalvotas ir aiškiai atsispindi modulių apraše. Visi studijų rezultatai gerai apibrėžti. Modulių išsidėstymas studijų plane tinkamas ir aiškus. Modulių aprašuose pateiktos nuorodos iš dalies neatnaujintos. Vertinimo grupė mano, kad modulių turinys atnaujintas labiau nei pagrindinės nuorodos. Maisto produktų technologijos programos studijų moduliai pagrįsti produktais, taigi bakalauro studijų metu turi būti įgyta daugiau bendrųjų ir išsamių žinių apie maisto perdirbimo technologijas ir maisto chemiją, biochemiją ir mikrobiologiją. Vertinimo grupė linkusi manyti, kad pirmosios pakopos, maisto technologijos studijų KTU, kurios nebuvo nagrinėjamos šiame vertinimo etape, metu studentams suteikiama tinkama žinių bazė, o profesinio bakalauro kolegines studijas, kurių programos įvertintos, neužtikrina tolesnėms studijoms pagal Maisto produktų technologijos programą reikalingų studijų rezultatų.

Programos apimtis yra pakankama, kad per nustatytą laiką būtų pasiekti studijų rezultatai. Magistrantūros studijų programa Maisto produktų technologija orientuota į aukšto lygio taikomaisiais tyrimais pagrįstas temas, jos tikslas – rengti vadovaujančius maisto technologijos specialistus. Tinkamai atsižvelgiama į mokslo pasiekimus.

Maisto produktų technologijos studijų programą dėsto 4 profesoriai, 11 docentų ir 3 lektoriai. Profesorų ir docentų akademinė patirtis yra didesnė nei reikalaujamas 10 metų laikotarpis. Maisto produktų technologijos studijų programos akademinis personalas pagirtinas už labai sėkmingą mokslo tiriamąją veiklą ir didelį tarptautinį judumą, kuris padeda palaikyti švietimo šiuolaikiškumą. Maisto technologijos srities dėstytojais per metus paskelbia vidutiniškai 50 mokslinių darbų, iš kurių 10–12 yra ISI Web of Science kategorijos publikacijos (pateikiamos ISI Web of Science duomenų bazėse), jie taip pat spausdinami svarbiausiuose tarptautiniuose žurnaluose maisto mokslo ir technologijos tema. Darbuotojų skaičius yra pakankamas numatomiems studijų rezultatams pasiekti, taip pat ir moksliniais tyrimais pagrįstoms studijoms atlikti visose maisto technologijos specializacijose.

Maisto technologijų katedroje yra pakankamai auditorijų Maisto produktų technologijos studijų programos moduliams įgyvendinti. KTU maisto technologijų katedroje yra chromatografijos, maisto reologijos ir struktūros, masių spektrometrijos, maisto cheminės analizės, biochemijos, ekstrakcijos, grūdų ir grūdų produktų laboratorijos. Maisto technologijų katedros prieinamumas, universalumas ir moderni įranga užtikrina maisto produktų technologijos studijų programos mokymo efektyvumą. Turimos nedidelės duonos, mėsos, žuvies, pieno, alaus gamybos technologinės linijos leidžia imituoti ir modeliuoti technologinius procesus.

Mokymo ir mokymosi įranga (laboratorių ir kompiuterinė įranga, vartojimo reikmenys) yra tinkamo dydžio ir kokybės maisto produktų technologijos magistrantūros programai įgyvendinti.

Maisto mokslų bakalauro programa matyt yra vienintelė Lietuvoje programa, kurią baigę absolventai gali tuoj pat tęsti studijas magistro laipsniui gauti.

Per paskutiniuosius penkerius metus KTU užregistruota 110 studentų studijuoti Maisto produktų technologijos programoje, 64 iš jų sėkmingai baigė studijas, 17 dar mokosi, taigi

faktiškai nubyrejo apie 24 proc. studentų. Šiuo metu dedamos pastangos laboratorinius darbus ir praktiką sutalpinti į tris darbo dienas, kad dirbantys magistrantūros studentai galėtų derinti darbą ir studijas. Studentų nubyrejimą dar stengiamasi sumažinti siūlant galimybę studijuoti pagal individualų planą arba teikiant papildomą metodinę medžiagą, individualias konsultacijas ir t. t. Studijų rezultatų vertinimo procedūra skaidri ir aiškiai apibrėžta.

Nė vienas Maisto produktų technologijos programos studentas nepasinaudojo ERASMUS judumo programa. Aiškinama, kad taip yra dėl mažos programos trukmės (1,5 metų) ir dėl to, kad studentai nenori atsisakyti savo ne visą darbo dieną trunkančių darbų.

KTU studentų ir administracinės institucijos rūpinasi studentų sportu, kultūrine veikla ir visuomeniniu gyvenimu. Studentų žinių, gebėjimų ir įgūdžių vertinimas apima kolokviumus, seminarus, darbą grupėse, individualias užduotis ir tikslus, juo siekiama paskatinti gerą akademinę veiklą ne tik per sesijas, bet ir semestro eigoje. Iš 62 proc. tyrime dalyvavusių programos absolventų 83 proc. šiuo metu dirba įmonėse ar valstybės institucijose pagal programos tikslą.

Studijų programos komitetas, rektoriaus įsakymu patvirtintas nuolat veikiantis padalinys, atnaujino ir patobulino Cheminės technologijos fakultete įgyvendinamą Maisto produktų technologijos programą. Lektorių ir studentų santykiai draugiški ir demokratiški, dėstytojais visada pasirenge diskutuoti ir konsultuoti. Tyrimo rezultatai rodo, kad studentus tenkina dėstytojų kvalifikacija.

Socialiniai partneriai, t. y. universiteto absolventai ir darbdaviai, taip pat dalyvauja vertinant programos kokybę; jie yra magistrantūros darbų gynimo komiteto nariai. Siekiant prisidėti prie studijų programos strateginio vystymo atsižvelgiant į kintančio pasaulio poreikius, turėtų būti taikomos kokybės užtikrinimo priemonės, t. y. naujų metodų diegimas į mokymo procesą ir studijų programos sandaros pokyčiai.

### III. REKOMENDACIJOS

Atsižvelgdama į Kauno technologijos universitete įgyvendinamos maisto produktų technologijų magistro studijų programos tobulinimo tikslus siekiant nacionalinio ir tarptautinio pripažinimo ekspertų grupė norėtų Kauno technologijos universiteto studijų programos komitetui, savianalizės suvestinės rengimo grupei ir administracijai rekomenduoti apsvarstyti šiuos veiksmus:

1. nustatyti labiau individualizuotus, konkrečius dviejų pagrindinių specializacijų (Technologijos ir Maitinimo) tikslus ir rezultatus ir pateikti informacijos apie tai, kaip šie tikslai ir rezultatai susiję su kita KTU teikiama magistrantūros programa „Maisto mokslas ir sauga“;
2. ištirti, galiausiai kartu su kolegijos atstovais, ar neįmanoma sutrumpinti papildomųjų studijų laikotarpio (iš Maisto technologijų profesinio bakalauro į magistro) taip, kad nenukentėtų magistrantūros studijų kokybė ir numatomi studijų rezultatai, bet būtų laikomasi nacionalinių reglamentų dėl studijų laikotarpio ilgumo;
3. pateikti vieną arba du pavyzdžius programų, kuriose studijų programos *Maisto produktų technologija* absolventai galėtų studijuoti doktorantūrą, ir kokius papildomus reikalavimus jie turėtų atitikti teikdami prašymus, kadangi KTU turi suteikti galimybę toliau studijuoti trečiosios pakopos doktorantūros programose ir kituose universitetuose;
4. ištirti galimybes ir būtinybę įdiegti pasirenkamuosius maitinimo technologijos ir organizavimo specializacijos studijų modelius, kadangi pasirenkamųjų studijų nėra;
5. konkrečiau aprašyti numatomus studijų rezultatų Baigiamojo mokslinio darbo dalyko apraše;
6. supaprastinti studijų procesą išnagrinėjus galimybes sujungti kai kuriuos smulkesnius studijų dalykų modulius į stambesnius;

7. atnaujinti studijų nuorodas studijų modulių aprašuose, įskaitant naujausią literatūrą ir elektronines visuomenės informavimo priemones, skatinti naudojimąsi „Moodle“ aplinka, įvairinant studijavimo būdus;
8. pagerinti laboratorijos saugos ir aplinkos apsaugos procedūras, pvz., cheminių atliekų šalinimo ir pirmosios pagalbos rinkinių įsigijimo, visiškai suderinti jas su nacionaliniais ir tarptautiniais teisės aktais;
9. ieškoti galimybių įtraukti studentus į tarptautines mainų programas, galiausiai parengti išsamų baigiamąjį darbą laipsniui gauti partnerių universitetuose;
10. įvairinti kokybės užtikrinimo sistemos priemones remiant naujovių diegimą ir tobulinant studijų programą atsižvelgiant į besikeičiančius maisto perdirbimo technologijų darbo rinkos poreikius;
11. apsvarstyti studijų programos tradicinio, bet šiek tiek pasenusio ir painaus pavadinimo „Maisto produktų technologija“ pakeitimo trumpesniu, išsamesniu ir studijų apimtį bei turinį geriau atspindinčiu pavadinimu „Maisto technologija“, klausimą.

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