



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

Kauno technologijos universiteto
**STUDIJŲ PROGRAMOS *MAISTO MOKSLAS IR
TECHNOLOGIJA (612E40001)*
VERTINIMO IŠVADOS**

**EVALUATION REPORT
OF *FOOD SCIENCE AND TECHNOLOGY (612E40001)*
STUDY PROGRAMME**

at Kaunas University of Technology

Grupės vadovas:
Team leader:

Prof. Dr. Anna Maraz

Grupės nariai:
Team members:

Prof. Dr. David Andrew McDowell

Prof. Dr. Eero Puolanne

Dr. Vidmantas Paulauskas

Mr. Darius Varanius

Išvados parengtos anglų kalba
Report language - English

Vilnius
2014

DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Maisto mokslas ir technologija</i>
Valstybinis kodas	612E40001
Studijų sritis	Technologijos mokslų
Studijų kryptis	Maisto technologija
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	Pirmoji
Studijų forma (trukmė metais)	Nuolatinės (4 metai)
Studijų programos apimtis kreditais	240
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Maisto technologijų bakalauras
Studijų programos įregistravimo data	2010 m. gegužės 3 d., No. V- 635

INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	<i>Food Science and Technology</i>
State code	612E40001
Study area	Technological Sciences
Study field	Food Technology
Kind of the study programme	University Studies
Study cycle	First
Study mode (length in years)	Full time (4 years)
Volume of the study programme in credits	240
Degree and (or) professional qualifications awarded	Bachelor of Food Technology
Date of registration of the study programme	May 03, 2010, No. V- 635

© Studijų kokybės vertinimo centras
The Centre for Quality Assessment in Higher Education

CONTENTS

CONTENTS	3
I. INTRODUCTION.....	4
II. PROGRAMME ANALYSIS	4
1. Programme aims and learning outcomes.....	4
2. Curriculum design	6
3. Staff	9
4. Facilities and learning resources	12
5. Study process and student assessment.....	13
6. Programme management	16
III. RECOMMENDATIONS	18
IV. SUMMARY	19
V. GENERAL ASSESSMENT	21

I. INTRODUCTION

An International Review Panel, organized by the Centre for Quality Assessment in Higher Education (SKVC), has evaluated the Bachelor of Science study programme *Food Science and Technology* (BS) (state code - 612E40001) offered by Kaunas University of Technology (KTU). The evaluation was based on the submitted Self Evaluation Report (SER) and related documentation, a site visit on April 29, 2014, and subsequent discussions within the Panel. The Programme was previously evaluated in detail in 2011 by a national panel, and a number of significant changes have been made to the course, based on the observations and recommendations contained in the report from the national panel. The International Review Panel took account of the recommendations from the 2011 report within their evaluation of the current study programme (spring 2014). They were pleased to note the positive changes in the study programme since 2011, and recognized the 2014 evaluation as a timely review of progress and development within a well-established programme.

The following evaluation of the Programme was prepared by the International Review Panel led by Prof. Dr. Anna Maraz, Corvinus University, Hungary, and included Prof. Dr. David McDowell, University of Ulster, Northern Ireland, Prof. Dr. Eero Puolanne, University of Helsinki, Finland, Dr. Vidmantas Paulauskas (social partner), State Food and Veterinary Service, Lithuania, and Mr. Darius Varanius (student member), Vilnius University, Lithuania.

II. PROGRAMME ANALYSIS

1. Programme aims and learning outcomes

KTU is the only university in Lithuania that delivers a BA programme in Food Science and Technology. The programme aims and learning outcomes are well designed, focusing on the achievement of appropriate academic requirements, preparing graduates to meet the national needs for public health nutrition and safety, and fulfilling appropriate professional and employment related requirements. The panel received evidence of the popularity of the programme, noting patterns of applicant admission rates of just over 10%, and increasing average point scores among successful applicants. Programme aims and learning outcomes are readily available on appropriate accessible websites.

The BA Food Science and Technology Programme has clear and well defined, if rather challenging, goals. The Panel received less information on how this course fits within the wider national education system, and how its content and aims differ from other food technology and related courses provided in Lithuania. Such information would be very valuable for potential applicants, government departments and social partners.

The Panel recognized that the simultaneously evaluated MS Food Science and Safety Programme has more specifically nuanced aims, which relate to, and build on the aims of the BS Programme. The Panel noted that about half of the BS graduates continue onto the MS degree. This raises some questions on the separate value of the BS degree, in terms of direct entry into employment, although this pattern does provide a route for those who wish to pursue careers outside academia.

The Panel recognized the value of recent strategic changes in the BSc programme, including increased focus on the flexible application of general principles of food technology across the full range of food and related commodities, while maintaining appropriate expertise in the major sectors including cereals, dairy and meat. Such changes should enable graduates to more easily adapt and apply their knowledge to deal with future challenges and opportunities in national and international food science and technology. The Panel does not recommend in-depth specialization options within the BS Programme, but does underline the importance of an appropriate range of scientific and practical expertise within the staff, to ensure the continuing delivery of high quality research and teaching.

The Panel noted that the availability of graduate employment opportunities remains good, which suggests that the nature and numbers of students graduating from the course are meeting current industry needs. This is significant, because the nature and content of the course mean that it might not be easy to rapidly increase the provision of the expertise and facilities necessary for this type of programme. Nevertheless, the national and international food production and processing industry is expanding and evolving, and discussions during the evaluation event highlighted the emerging demands associated with such changes. The Panel therefore recommends that the programme team should establish a process of formal horizon scanning to ensure that the programme continues to produce a balanced number of graduates who have the knowledge, expertise and flexibility to operate effectively within the national and international food science and technology sectors of the future.

The stated aims and planned outcomes of the BS degree fully meet, and perhaps exceed, the

requirements of a programme of this level. The BS degree is a major feeder programme for two MS programmes (Food Science and Safety; Food Product Development) also delivered by KTU. As it stands, the BS programme is clearly more extensive and ambitious than BS programmes in other institutions in Europe. The Panel thought that there needs to be careful consideration of the relationships among the BS and the two other food related programmes within KTU (MS in Food Science and Safety, MS Food Product Technology) to avoid confusion among applicants, stakeholders, social partners and potential employers. It would be important to establish the target roles of graduates from the BS. Are they being prepared for the highest professional and innovative levels within the food production, processing and catering industries, with considerable engagement in research and development activities, or prepared for middle management in established operations, with perhaps less emphasis on research and development? Such decisions will inform the development and delivery of the BS programme. Otherwise, there are dangers of the programme becoming too ambitious, and out of line with similarly named courses provided by other institutions.

The Panel concluded that the learning outcomes are well specified, although some of the intended outcomes presented within the course descriptions are stated in rather ambitious terms. Given that some of the food science/technology elements are associated with the delivery of underpinning fundamental knowledge, rather than directly preparing graduates to work in specific sectors, the current balance of learning outcomes appear optimal, especially as many, if not most, of the graduates take up the option to progress onto an MS degree programme in the food area at KTU.

Currently, the BS programme, although clearly underpinned by an appropriate range of natural sciences, is more closely focused on technology. Bearing in mind its aims and content, within the range of other food related programmes at KTU, the Panel suggest that KTU should consider the current name of the programme to ensure that it continues to accurately describe the evolving content of the programme, and that the programme is clearly differentiated from other food related programmes provided by KTU and other institutions.

2. Curriculum design

Consideration of the documentation supplied to the Panel established that the proposed study programme curriculum design meets legal requirements: i.e. the volume of the programme is 240 credits, each of the two modules comprises 15 credits, the volume of subject for full-time and

part-time studies are equal, no more than 7 subjects are taught per semester, general university subjects comprise 15 credits, subjects of study field comprise 165 credits, the volume of practical placement is 15 credits and preparation of final thesis and defense comprise 12 credits.

The indicated student workloads are principally dictated by the presented study credits, and are appropriately distributed across the semesters within the programme. The Panel noted little or no overlap among programme elements, and concluded that any minor overlaps were necessary to connect different approaches and cognate subject material. The relative sizes of individual modules are well considered and appropriate. The order of delivery of curriculum elements is logical and provides a good structure for the development and application of student knowledge and competencies. The Panel noted that the programme has been recently updated, which has presented opportunities to introduce a new and more rational curriculum format. In broad terms, the programme credits are now more appropriately distributed to deliver a well-balanced and well-designed degree in food technology, i.e. approximately one eighth of the total number of credits to each of engineering sciences and social sciences, approximately one third to natural sciences, and the remainder to food sciences, including practical training and the compulsory degree project.

The total number of student contact hours is high, which is good in terms of student development, but may prove expensive in the longer term. The programme teaching team may therefore need to consider including more independent study, as a cost effective means of encouraging student led, competence-building learning. It is evident that the programme has been well developed and thought-through, with individual courses and their contents fitting together well to form a cohesive entity, based on the strong backbone of natural sciences. This approach seems likely to continue to be successful, although the Panel did not have the opportunity to check how well the materials are being absorbed and assimilated by the students. The Panel recognises the provision of periods of practical industry based activities as a significant strength of the programme, as these allow students to gain and apply practical knowledge. Although it may be difficult to arrange within some taught course elements, or during periods of practical experience within industry, greater collaboration between university teachers and industrial/social supervisors is likely to be of considerable benefit to all concerned i.e. students, staff and industrial/social partners.

The food science and technology elements of the curriculum are firmly constructed on the sound platform provided by the elements of basic natural sciences. The areas covered in these elements

are central for the development of appropriate competencies in modern food science/technology. The Panel recognized that much of the programme is applicable across the broad scheme of food science/technology, with a degree of specialization on dairy and functional foods, and to a lesser extent cereals. However, there is less emphasis than might have been expected in relation to meat and meat products. Discussions during the Panel visit established that the current balance among the above commodities reflects a number of strategic decisions within the University. Nevertheless, during the site visit, the Panel was able to confirm that all of these commodity areas are effectively resourced in terms of teaching staff and laboratory/pilot plant facilities. The Panel noted two partial specialization pathways/modules (food technologies; catering technology), which are available to students within the wider programme provision. The Panel considers the provision of such partial specialization pathways as very appropriate within this type of BS programme.

The Panel noted evidence that the methodological part of the programme deals well with aspects of novel methodologies in food engineering and related analysis. Food science aspects, while appropriate, are less developed, reflecting the relatively lower significance of these aspects within the overall programme. The bulk of the research and innovation developments, which underpin and inform student learning on the BS programme are associated with a number of commodity-based research groups within the University, although there are also well established and significant linkages with a large number of leading food science and technology research communities in other parts of the world.

The Panel received considerable evidence of commitment at University and Department levels to supporting student practical training. Students and social partners spoke highly of the value and quality of such practical training in relation to their personal and professional development. Both these groups strongly recommended that, if at all possible, the amount of time allocated to such student practical training should be increased. The Panel was pleased to note that plans were already in place to extend this valuable aspect of the programme.

Overall, the Panel agreed that, in terms of curriculum aspects, the BS programme is well designed, concise, and compares very favorably with similar programmes in other countries. The curriculum design and organization observed in KTU during this evaluation, is a good example of the effective delivery of BS training in food technology, at a university of technology.

3. Staff

The Panel noted that in line with KTU policy, teachers are competitively evaluated as part of the initial selection/appointment process, and are subsequently reevaluated every five years to confirm progress and compliance in relation to formal qualification requirements. The Panel was able to confirm that the teaching staff team meets the legal requirements in relation to the number of staff holding doctoral degrees, their backgrounds as teachers, their relevant research activities, and their established international reputations and experience in developing and delivering this kind of study programme.

The Panel noted that a total of 40 full time active teachers (coordinating lecturers) are involved in the BS Programme. Staffs from a number of departments within the Faculty of Chemical Technology are principally involved in teaching on the programme. In addition, around 1/3 of overall staff teaching team, drawn from other faculties, make considerable contributions to the implementation and delivery of the curriculum. Less information was available about staff from other faculties, than about staff within the Faculty of Chemical Technology.

The Panel noted that, within the Faculty of Chemical Technology, 6 professors, 14 associate professors and 5 lecturers are involved in organizing and delivering the BS programme. All the professors, and some associate professors, also participate in PhD training. The teaching team is occasionally supplemented with scientists from other institutions who bring additional specialist input in applied areas of the programme. Industry experts also contribute as guest lecturers in some aspects of food technology. The current number of teaching staff is adequate to ensure the achievement of the programme aims.

The Panel noted that the technical and administrative staff of the Department of Food Science and Technology effectively support the delivery of the programme. Careful planning and ongoing development of staff knowledge and competencies means that the professional and educational profile of the staff is currently sufficient to cover the range of food science and technology related activities in the programme. However, during the visit, staff members explained the need for more technical staff to maintain and operate the increasing diversity and complexity of equipment necessary to support the programme.

Discussions with students, and graduates further confirmed student satisfaction survey data and highlighted their appreciation of the high quality and quantity of support and encouragement provided by the teaching staff. This is clearly a continuing strength of the programme.

The panel considered the teaching staff CVs and other related information, which confirmed that the teaching team fulfils the qualification requirements for the delivery of the programme. The Panel received information in relation to the assessment and qualification system which operates within KTU to ensure the continuing development of staff qualifications and skills in support of the teaching and research aspects of the programme. The Panel noted with interest the Centre of Distance Learning provided by KTU to help teachers to develop their pedagogical skills, in relation to new interactive teaching and assessment methods. The panel were informed on developments in the application of new e-learning platforms (e.g. Moodle), and plans for the wider application of such systems within the programme.

Of the wider teaching team of forty, twenty-three teachers improved their qualifications during the evaluation period, mainly by teaching abroad for periods of 1 week or more. Some teachers undertook such teaching on more than one occasion. The scale and extent of such activities is good in relation to teaching at BS level. Nevertheless, the teaching team should usefully consider increasing the overall participation rates in these activities, to ensure that a wider range and number of teachers are participating in such mobility programs. In addition, extension of the duration of periods of teaching and/or research visits abroad may be a valuable means of extending the international scope and visibility of the programme. The Panel noted that a number of visiting professors, working mainly within the framework provided by the ERASMUS scheme, visit and contribute lectures, providing further opportunities for students to improve their foreign language competence, professional knowledge and qualifications.

In overall terms, the research activities of the teaching team, and the research directions being pursued, are adequate and relevant to the aims, curriculum structure and learning outcomes of the BS programme. The Panel received evidence that some members of the teaching team have, and maintain impressive research profiles. The breadth of the course and the overall student experience would be enhanced if more members of the teaching team (mainly the associate professors and lecturers), could become more actively engaged in research projects in areas relevant to the programme. Similarly, the publication outputs of some members of the teaching team are significant in number and quality in a range of course related areas, but the team should aim to extend these patterns more generally within the wider teaching team.

The research funding of the Department is quite high and continues to increase. The Panel noted evidence that a number of members of staff are project leaders and/or members of significant

international and national projects. Engagement in such projects makes an important contribution to the health and development of the program, by enhancing the infrastructure and research potential necessary to support and inform teaching and learning of new and emerging research and technological practices. It also facilitates the identification of appropriate innovative topics for final degree projects within the BS programme. The Panel was pleased to note the considerable contributions made by some professors in this area, not only to the continuous improvement of the teaching provided, but in identifying and sourcing additional new research resources, and enabling students and staff to engage in developing international collaborations.

During the visit, staff members confirmed their appreciation of the support currently provided by the University to enable staff to participate in national/international conferences, international mobility programs and distance learning. The panel noted that the extent of participation depends on the initiative of individual teachers, as monetary and other conditions for sabbatical leaves are very limited. A number of staff would welcome wider support in this area.

The Panel noted that, during the last year, around 70% of the courses (contact hours) was delivered by professors and associate professors. This is a creditable ratio and is appropriate to the aims and objectives of this BS programme. In wider terms, the Panel noted the valuable contribution to the programme made by three researchers and twelve 12 PhD students, , and the opportunities in terms of personal development offered by their inclusion in the teaching team.

The Panel observed that current levels of staff turnover are relatively low, which contributes to the wider stability of the teaching team. The Panel noted changes in the age profile of the teaching staff since a number of teachers retired around 2000, and new appointments since that time which have brought in the experience and expertise necessary to effectively deliver the new areas of teaching and research developed over recent years. The average age of the teaching team (50.9 years) is appropriate for the provision of the programme.

In more general terms, the teaching staff is competent to deliver the specified teaching at bachelor level, and has the experience, expertise and qualifications to achieve the learning outcomes of the programme.

4. Facilities and learning resources

The panel consider that the specialist facilities, as reported in the preliminary documentation, and/or viewed during the site visit, are particularly strong in some areas, and are in general appropriate to the achievement of the aims of the programme.

The space set aside for specialist practical student activities, i.e. teaching, research, small scale/pilot simulation and sensory analysis laboratories, is generally sufficient to facilitate the delivery of the planned curriculum, bearing in mind the suggested student cohort numbers, i.e. lectures – 100 students, practice – 25 students, and laboratory work – 12 students. Wider learning support facilities, i.e. classrooms, seminar rooms computing, audio, video and related IT/web based/intranet provision has been recently reviewed and updated within the last 5 years. Furthermore, the teaching and learning facilities within the Department have been enhanced in some areas by the acquisition of additional novel analytical systems, and by the provision of a number of pilot/small scale experimental food production/processing systems. Some of these are excellent.

Teaching materials are available within the Central University Library, with more specific course related material provided within the Departmental Library. Other available sources include KTU bookshop, in-house produced books, and intranet provision of lecture slides, lectures summaries, descriptions of laboratory work, course papers and homework assignments. Such resources are constantly updated by teaching staff. While the majority of the reading material on the study modules and book lists is appropriate, the Panel considered that the teaching team could usefully review and update this material, particularly in relation to some of the newer aspects of the BS programme.

Students were very complimentary in relation to individual and group staff efforts to help students in identifying and effectively using the full range of provision for student learning, practice, and professional development. They did, however, express some concerns in relation to the relatively small numbers of copies of key texts within the library, in comparison to the number of students wishing to access such texts at peak times.

In general labs are well equipped, although some of these are quite small in size, and may come under pressure, bearing in mind the competition among student groups, and other programmes within the Department, to use these specialist facilities.

The site visit to the current microbiology facilities confirmed concerns identified prior to the visit in relation to this area. Although well maintained, the microbiology facilities are cramped, and are unlikely to be able to adequately support the recently strengthened courses in microbiology within this programme. The Panel was reassured to learn that the microbiology facilities are to be renovated and/or expanded within the very near future. The Panel was not provided with any details on these imminent developments, but did confirm that such improvements would be necessary to support safe and effective student learning in these areas. These improvements should be matched by appropriate enhancements/expansion in teaching and research equipment in these areas. Some thought could also be given to ensuring that these improvements include adequate access to modern molecular microbiological analysis systems (as such systems are routinely used in most standard food microbiology laboratories).

5. Study process and student assessment

The admission requirements are clear and presented on the University website. The entrance requirements specified for entry to the BS programme are appropriate. The programme has proved attractive and the number of entrants has ranged between 67 and 81 during the last 5 years. The lowest enrolments were in Academic Years 2010/2011 (67) and 2013/2014 (69) despite increased numbers of applicants, e.g. 512 in 2013/2014. The Panel received information which attributed restriction of enrolment numbers to reductions in the numbers of state-funded places and changes in the programme in 2013. The Panel learned that while overall application rates remain healthy, within the headline figure of the total number of 512 applicants, only 89 applicants had this programme as their first choice, which is not much higher than the actual number of students subsequently enrolled on the programme (69). The Panel suggests that a rolling detailed analysis of first choice applications versus other choices, along with enrollment, drop-out numbers, and successful graduate numbers, would provide useful information on student application and success rates.

The Panel concluded that the presentation and the organization of the study process are reasonable. Studies are undertaken within 2 x 16 week semesters. Information on the specific content, objectives and assessment procedures (and schedule) is clearly presented on the KTU

website and in the annual edition 'KTU Study Programmes'. Work loads per week and semester are reasonably well distributed– i.e. contact hours do not exceed 8 hours per day and academic contact hours do not exceed 32 hours per week. No more than 7 subjects are taught per semester. The study subject syllabi are placed on the Faculty's bulletin website, and on the Students' Union website, no later than five days before the start of the each semester. The Panel concluded that these arrangements effectively support the delivery of the study programme.

The Panel noted that students are provided with a range of opportunities to be involved in scientific research in several annual events organized by KTU Student Scientific Society, such as "Young Scientist ABC", "Researcher's Night" and "Exhibition KTU Technorama". The Panel commended such activities, but was uncertain as to the numbers of students from the BSc programme who participate in such annual events and projects.

The Panel noted that, within the five-year period 2009/10 to 2013/14, only eight students participated in EU mobility programmes – suggesting that the proportions of BS students willing to study and to seek experience at other European universities is rather low. This relative lack of mobility contrasts sharply with the target adopted by Ministers of Education of all EU countries - that 20% of all graduates should have studied abroad by the year 2020. Discussions during the site visit established that rates of participation in EU mobility programmes are much higher in other study programmes at KTU, such as the MSc in Food Science and Safety.

The Panel received evidence of increasing use of E-learning platforms (e.g. Moodle, Blackboard, etc.), which can be very effective in making national and international learning resources available to students. The Panel suggests that use of Moodle should be extended to all subjects, not only as an information repository, but also to contribute to students' individual development and collaborative learning. Further staff training should be provided in order to develop teachers' technological, pedagogical and methodological e-skills and knowledge more widely within the teaching team.

The Panel members examined a number of BS theses during the site visit. These were interesting, very relevant to the aims and objectives of the BS programme, and generally prepared and presented to a high standard. The Panel did however note that, among the sample theses viewed, there was limited evidence of robust application of statistical analysis, which is frequently a key element of research studies in food science and technology at this level of study.

Supplied documentation, and discussions during the visit, confirmed that the students are provided with good level of social and academic support. Teachers are supportive, approachable and make considerable efforts to help students and social partners understand the wider aims of the teaching programme. The Panel noted numerous examples of social and academic support for students including programme coordinator meetings to help with career planning and related matters, financial support system, the Center of Physical Culture and Sport, a range of student media activities (e.g., newspaper, radio station), availability of University dormitories, mentoring programs etc.

Graduates and current students were consistently keen to express their appreciation of these aspects of wider social and pastoral support, and frequently reported how much they valued this support in helping them through their years of study at KTU.

Assessment procedures are clear, transparent and appropriate to the level, content and objectives of study programmes at this level. Review of documentation, and discussions with teaching staff and students, allowed the Panel to confirm that a suitable and flexible range of assessment procedures are being effectively used in the assessment of individual and student group activities – throughout the study programme. These included written, verbal, and laboratory based, individual and group assessments, industry relevant group work, and individual research projects. The Panel was satisfied that the range of methods applied is providing an effective means of confirming that students are meeting the aims, and achieving the objectives, of the study programme.

Discussions with the teaching team established that the vast majority of the graduates are meeting the expectations of the programme providers. The members of the teaching team are rightly proud of their graduates, and maintain longer terms contacts with graduates moving on into employment within industry, the public sector, and national and international research activities. These relationships provide additional strengths to the programme in relation to opportunities for developments in student professional practice, and longer term industry engagement with KTU.

Extensive discussions with a range of employers and social partners made it clear to the Panel that the knowledge, expertise and professional activities of the graduates clearly meet industry and social partner expectations, and that the graduates from this programme are popular with employers.

6. Programme management

Provided documentation and discussions during the visit allowed the Panel to confirm that the study programme is well organized, and managed. There are clear and universally understood channels of decision making, course monitoring and communications at all levels.

In relation to new courses, higher level programme policy and management decisions are effectively derived and actioned in line with relevant Government, University and Faculty structures and guidelines. Major strategic decisions such as study programme direction and renewal are made by the KTU Senate, and actioned by the Vice Rector of Studies and Study Program Committee (SPC). After initial approval, study programmes are prepared within the appropriate faculty, principally by teaching teams, in collaboration with students and social partners, and then subjected to internal and external evaluation prior to programme launch. The Panel received evidence of the existence of effective structures, at each of the above levels, for the formal review, and where appropriate revision and refinement, of the BS study programme.

In relation to established study programmes, the Panel noted that significant study programme related documents, along with accumulated and routinely updated statistical data about student and teacher/researcher activities, and other relevant information, are formally examined within the annual study programme review specified by standard University procedures. The Panel noted that all study programmes are subject to more comprehensive review every three years, a process which includes, among other things, formal reevaluation and updating of modules by the teachers involved in their delivery.

The Panel considered the presented cycle of study programme development and review provides a rational and robust mechanism for the gathering and evaluation of “internal” and “external” information, which informs and supports significant decisions about the study programme.

The Panel received documentation from, and had discussions with, representatives of the Faculty, Department, teaching team, students, industry and social partners, in relation to study programme quality assurance. The Panel noted the wider Faculty and University level student feedback systems, including those involving the Strategic Planning and Quality and Planning Systems, Assessment Commission, and Faculty Administration.

Less formal feedback from students and social partners is also collected during face-to face discussions. The Panel considered that such less formal information from students, employers and social partners is still important, and were pleased to note plans to capture this information onto a rolling database, and to include it in future formal reviews. That said, the Panel concluded that current means of gathering feedback to inform formal reviews are functioning well, providing useful information, and are widely appreciated by students, industry and social partners.

The Panel noted that the BS Programme was subject to a very detailed evaluation by a national expert panel in 2011. The Panel considered the suggestions and outcomes from that review which included substantial changes in study programme structure and contents.

These included

- A new introductory study subject to increase student motivation, and to present the food elements of the study programme against the background of the key underpinning natural sciences.
- Changes in study programme length and content in fundamental biological, chemical and microbiological aspects of the programme.
- More emphasis on broader food study aspects, facilitated by reductions in commodity-specific content.
- New content in relation to food safety, and business aspects such as economics.

The Panel recognized the value of such changes, and the major commitment within the Department to continue to fully integrate such changes within the overall programme. During the site visit, the Panel received a number of very positive comments from social partners and from graduates, in relation to these valuable changes in the Programme.

In overall terms, the Panel concluded that the programme management system for the BS is working well. It is effectively supporting and monitoring the development of the BS study programme, in prepared graduates with the necessary characteristics and capacities to drive forward industry and research in support of food technology based businesses and related research in Lithuania.

The Panel wish to express their thanks for the very positive and open approach taken by staff at all levels within KTU, as well as the numerous positive and constructive contributions by students, graduates, industrial and social partners, all of whom made it clear that they were

pleased to be associated with this well established, popular and nationally significant study programme. Their professional approach to the discussions contributed significantly to what the Panel hopes was a productive and effective evaluation event.

III. RECOMMENDATIONS

1. There should be a rolling survey on the patterns and challenges in the medium (5-10 year) and longer term (11 – 20 year) development of the food industry in Lithuania, to inform the ongoing development, content and delivery of the programme. The survey should seek, for example, to identify and quantify information on industry needs and age profiles, as well as the future educational needs, knowledge and competence profiles to support and develop the Lithuanian food production and processing industries into the future.
2. The Department should ensure that the planned refurbishment/expansion of the microbiological facilities should be completed as soon as possible, alongside the provision of related molecular microbiology equipment (e.g. PCR and related rapid detection/identification systems) necessary to support appropriate student learning in this area.
3. The Department should continue the planned expansion of student practice, as a key aspect of study learning and competence development.
4. The Department should consider provision of more copies of key texts, especially those used by more than one study programme.
5. The Faculty should put more efforts in enhancing students' mobility.
6. The teaching team should review and update the study module recommended text lists, and book lists, to make sure that student have enough access to newer literature, especially in relation to newer aspects of the programme.
7. The Department should encourage and facilitate a better balance of teaching and research across the teaching team.

IV. SUMMARY

The BS Food Science and Technology Programme has clear and well defined, but at the same time rather challenging, goals. The aims and learning outcomes are focusing mainly on meeting national needs for experts in food processing, catering and nutrition, who satisfy the professional requirements of the current labour market. However, an on-going survey of the emerging needs of the Lithuanian food sector and related areas would help in on-going course monitoring and development.

The curriculum design meets legal requirements - it is well designed, concise, and stronger than most other similar BSc programmes in many other European countries. As the consequence of recent updates of the programme, the curriculum now has a rational order and content of study subjects. The curriculum design is appropriate and confirms that food technology, organized this way, is well suited to a technical university. However, the programme, and graduates, would be further improved by increasing the amount of time allocated to student practical training.

The size, composition and expertise of the teaching staff meet legal requirements. The number of doctoral degree holders is adequate. The professional and educational profiles of teachers, their research activities, and international reputations are also suitable for the delivery of this kind of study programme. Invitation of guest lecturers from the industry and abroad provides additional opportunities for the students to improve their professional qualification and foreign language competence.

A considerable number of the teaching staff participates in international mobility programs, although the programme would benefit from wider staff engagement with such programmes. The Department should aim to increase the number of staff taking part in international mobility programs, and where possible, to extend the duration of such educational and/or research visits, to enrich the study programme and student learning. The significant levels of research and publication activity of several teaching staff members are to be commended, but there is a need for greater involvement of other staff, especially associate professors and lecturers, in such educational and research projects.

Staff members are generally satisfied with the conditions offered by the University, but indicated that they would welcome improvements in the provision of sabbatical leave. Teachers are competitively evaluated at their first recruitment and every five years thereafter to ensure compliance with specified qualification requirements.

Current and previous students are very satisfied with, and very appreciative of, the teachers' performance. They perceive their teachers as effective, supportive and approachable.

The substantial teaching and learning facilities within the Department have been significantly enhanced in a number of areas (e.g. additional novel analytical systems and provision of a number of pilot/small scale experimental food production/processing systems). Provision in some areas is excellent. In general, laboratories are well equipped but some of them are relatively small, and the current microbiology facilities are especially cramped.

The programme has proved attractive to entering students and the admission requirements are clear and appropriate. In general the organisation of the study process is reasonable and the assessment procedure is clear, transparent and appropriate.

Students have opportunities to be involved in scientific research in several annual events organized by KTU Student Scientific Society. However international mobility rates could be increased.

E-learning platforms are increasingly widely used among the students, but less widely among the teachers. Training for staff should be provided in order to develop their e-skills and knowledge in the future.

The Programme is regularly evaluated, which ensures continuing currency and improvement.

V. GENERAL ASSESSMENT

The study programme *Food Science and Technology* (state code – 612E40001) at Kaunas University of Technology is given **positive** evaluation.

Study programme assessment in points by evaluation areas.

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

*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.

Grupės vadovas:
Team leader:

Prof. dr. Anna Maraz

Grupės nariai:
Team members:

Prof. Dr. David Andrew McDowell

Prof.dr. Eero Puolanne

Dr. Vidmantas Paulauskas

Mr. Darius Varanius

**KAUNO TECHNOLOGIJOS UNIVERSITETO PIRMOSIOS PAKOPOS STUDIJŲ
PROGRAMOS MAISTO MOKSLAS IR TECHNOLOGIJA (VALSTYBINIS KODAS –
612E40001) 2014-07-07 EKSPERTINIO VERTINIMO IŠVADŲ NR. SV4-402 IŠRAŠAS**

<...>

V. APIBENDRINAMASIS ĮVERTINIMAS

Kauno technologijos universiteto studijų programa *Maisto mokslas ir technologija* (valstybinis kodas – 612E40001) vertinama teigiamai.

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

* 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

Bakalauro programa *Maisto mokslas ir technologija* turi aiškius ir gerai apibrėžtus, tačiau tuo pačiu metu gana ambicingus tikslus. Programos tikslai ir studijų rezultatai orientuoti daugiausiai į šalies specialistų, atitinkančių šiuo metu darbo rinkoje galiojančius profesinius reikalavimus, paklausą maisto perdirbimo, viešojo maitinimo ir mitybos srityse. Tačiau Lietuvos maisto sektoriuje ir susijusiose srityse atsirandančių poreikių tęstinis tyrimas padėtų vykdyti nuolatinę programos stebėjimą ir tobulinimą.

Programos sandara atitinka teisinius reikalavimus – studijų planas yra gerai sudarytas, glaustas ir stipresnis nei daugelis kitų panašių bakalauro studijų programų daugelyje kitų Europos šalių. Po neseniai atliktų programos atnaujinimų, studijų dalykų išdėstymas programoje yra logiškas. Programos sandara yra deramos struktūros, kuri patvirtina, kad tokiu būdu organizuota maisto

technologijos programa dera su technologijos universiteto profiliu. Tačiau studentų praktiniam mokymui skiriant daugiau laiko, iš to laimėtų tiek programa, tiek ir absolventai.

Dėstančiojo personalo skaičius, sudėtis ir turimos žinios atitinka teisinius reikalavimus. Tarp personalo narių yra reikiamas skaičius daktaro laipsnį turinčių dėstytojų. Dėstytojų profesinės ir pedagoginės kompetencijos, jų mokslinė veikla ir tarptautinė reputacija taip pat atitinka šio tipo studijų programai keliamus reikalavimus. Kviestinių dėstytojų iš pramonės sektoriaus ir dėstytojų iš užsienio paskaitos suteikia studentams papildomų galimybių tobulinti jų profesines žinias ir užsienio kalbos mokėjimą.

Nemaža dalis dėstytojų dalyvauja tarptautinėse judumo programose, tačiau studijų programai būtų naudinga, jeigu į jas būtų įsitraukiama aktyviau. Katedra turėtų siekti padidinti personalo narių, dalyvaujančių tarptautinėse judumo programose, skaičių, ir kur įmanoma turėtų didinti tokių pedagoginių ir (arba) mokslinių vizitų trukmę, taip pagerindama tiek studijų programą, tiek ir studentų mokymą. Reikėtų pagirti keletą dėstytojų už jų aktyvią mokslinę veiklą, publikacijų rengimą, tačiau būtina didinti likusių personalo narių, ypač docentų ir lektorių, dalyvavimą tokiuose pedagoginiuose ir moksliniuose projektuose.

Personalą iš esmės tenkina Universiteto siūlomos darbo sąlygos, tačiau pageidautų, kad būtų patobulinta kūrybinių atostogų suteikimo sistema. Dėstytojų kompetencija vertinama juos įdarbinant ir vėliau kas penkerius metus, kad būtų užtikrintas jų atitikimas nustatytiems kvalifikaciniais reikalavimams.

Dabartiniai ir buvę studentai yra itin patenkinti ir labai vertina dėstytojų darbą. Juos apibūdina kaip kompetentingus, palaikančius ir draugiškus.

Katedrai svarbios mokymo ir mokymosi priemonės/ patalpos buvo pastebimai pagerintos daugelyje sričių (pvz., papildomos naujoviškos analitinės sistemos ir bandomųjų arba smulkaus masto eksperimentinių maisto gamybos ir perdirbimo sistemų įsigijimas). Turimos priemonės kai kuriose srityse yra puikios. Apskritai, laboratorijos yra gerai aprūpintos įranga, tačiau kai kurios jų santykinai mažos, o turimos mikrobiologijos patalpos yra ypač ankštos.

Programa yra patraukli stojantiesiems, o priėmimo reikalavimai aiškūs ir tinkami. Apskritai, studijų procesas yra sklandžiai organizuojamas, o studentų vertinimo procedūra aiški, skaidri ir tinkama.

Studentams siūloma galimybė dalyvauti moksliniuose tyrimuose skirtuose keliems metiniams renginiams, kuriuos organizuoja KTU Studentų mokslinė draugija. Tačiau studentų tarptautinio judumo rodikliai turėtų būti gerinami.

Vis didesnis skaičius studentų naudojami e. mokymosi platformomis, to negalima pasakyti apie dėstytojus. Turėtų būti organizuojami personalo mokymai, per kuriuos būtų gerinami jų e. įgūdžiai ir žinios.

Programa yra reguliariai vertinama, užtikrinant jos nuolatinį aktualumą ir tobulinimą.

<...>

III. REKOMENDACIJOS

1. Reikėtų vykdyti išplėstinį ilgalaikį tyrimą, siekiant ištirti pokyčių, vykstančių Lietuvos maisto pramonėje vidutiniu (5–10 metų) ir ilguoju (11–20 metų) laikotarpiu, modelius ir iššūkius, kad programos plėtra, turinys ir dėstymas galėtų būti nuolat koreguojami remiantis tyrimo metu gauta informacija. Vienas iš tyrimo tikslų galėtų būti, pavyzdžiui, nustatyti ir apskaičiuoti pramonės sektoriaus poreikius ir amžiaus grupes bei būsimus švietimo poreikius, žinias ir kompetencijas, siekiant ateityje remti ir vystyti Lietuvos maisto pramonės ir perdirbimo pramonės šakas.
2. Katedra turėtų užtikrinti kiek įmanoma skubesnį mikrobiologijos laboratorijos atnaujinimą ir plėtrą, taip pat įsigyti susijusios molekulinės mikrobiologijos įrangos (pvz., termociklerį ir susijusias greito aptikimo ir nustatymo sistemas), kuri būtina siekiant užtikrinti tinkamą studentų mokymą šioje srityje.
3. Katedra turėtų tęsti planinę studentų praktinio mokymo plėtrą, kadangi praktinis mokymas yra vienas esminių mokymosi ir kompetencijų kūrimo priemonių.
4. Katedra turėtų apsvarstyti galimybę įsigyti daugiau pagrindinių vadovėlių egzempliorių, ypač tų vadovėlių, kuriais naudojasi kelių studijų programų studentai.
5. Fakultetas turėtų stengtis didinti studentų tarptautinį judumą.
6. Dėstytojų komanda turėtų peržiūrėti ir atnaujinti rekomenduojamų vadovėlių ir knygų sąrašus, siekiant užtikrinti studentams prieigą prie naujesnės literatūros, ypač naujesnių programos dalykų atveju.
7. Katedra turėtų skatinti ir padėti dėstytojų komandai pasiekti geresnį balansą tarp dėstymui ir moksliniams tyrimams skiriamo laiko.

<...>

Paslaugos teikėjas patvirtina, jog yra susipažinęs su Lietuvos Respublikos baudžiamojo kodekso 235 straipsnio, numatančio atsakomybę už melagingą ar žinomai neteisingai atliktą vertimą, reikalavimais.

Vertėjos rekvizitai (vardas, pavardė, parašas)