



IE-3-(AP4\_MK1; AP4\_MK2)

**University of Szeged  
Faculty of Engineering  
and  
Oradea University  
Faculty of Environmental Protection**



**FINAL REPORT**

**on Food Science and Technology Engineer MSc  
education in cooperation University of Szeged and  
Oradea University**

Szeged (Hungary)/Oradea (Romania)

2019



a  
2007/7/XIV/2/4 MAB (Hungarian Accreditation Committee) authorized by decision  
food engineering  
according to Hungarian language master (MSc) programme

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## Introduction

Common curriculum development has a project number in headings. Subproject is AP4 Carpathian education space, AP4\_MK2 Cross-border cooperation development, expansion in agricultural education, deepening cooperation in agro-food business subtopics at University of Szeged Faculty of Engineering, and Oradea University Faculty of Environmental Protection Food Science and Technology Engineering (MSc) programme possible start of its common education at both universities.

Both universities have permissions to educate over mentioned study programme in their home country in native language and English. Having graduated students get **Food Science and Technology Engineer** master degree (MSc) in their diploma.

### Admission degree (BSc) to the Master's program:

- Including full credit value:
  - in the field of agrarian training: basic training in food engineering;
  - in the field of technical training: biomedical engineering and chemical engineering.
- Qualifications that are acceptable for the additional differential exam:
  - from agricultural training: agricultural engineering, environmental management in agricultural engineering, crop engineering, animal husbandry engineering, horticultural, agricultural and food engineering courses;
  - in the field of technical training: basic engineering in environmental engineering;
  - from science education: biology, physics, chemistry bachelor degree programs;
  - from medical and health science education: nursing and patient care basic education specialty.
    - in addition to the basic or master's degree programs or the 1993 LXXX on Higher Education Act. Bachelor or university-level undergraduate courses in accordance with the Act, which, on the basis of a comparison of the knowledge on which the credit is based, are accepted by the credit transfer committee of the higher education institution.

Curriculum: 4 semesters

Number of credits earned: 120

Until graduation students write thesis (diploma work) for 30 credits and they have vocational training, internship in summer.

Knowledge and competences, skills, attitudes, autonomy and responsibility

detailed in course descriptions, not in this essay.

Just the most important ones. The goal of Food Science and Technology Engineer education is to issue such engineers whom able to use the newest scientific results, well informed on natural sciences and technology. They can use their knowledge in different areas in practice of food industry. Graduated students according to their competences are ready to continue their further education in doctoral (PhD) programmes.

a) Knowledge and competences learnt in master programme:

- changes in food raw materials and food,
- food process planning and control technology,
- food raw material knowledge,
- knowledge of food processing, storage and packaging,
- fermentation and bioconversion knowledge,
- fermentation technology,
- nutrition science and food development knowledge,
- knowledge of logistics, commodity handling and distribution,
- food technology, food safety and quality knowledge,
- food ethics,
- IT and scientific research and development skills.

b) Skills after graduation:

- planning and development engineer, researcher positions,
- to develop and manage research and development programs and projects,
- food industry processes,
- to carry out management tasks in food industry and related fields,
- to transfer knowledge in the field of education and counselling.

c) Attitudes:

- ability and skill to identify and solve problems with the toolbox of science,
- critical evaluation of development work related to the field,
- developer and designer approach,
- coordination capability,
- motivation to expand knowledge and apply new knowledge,
- to improve food safety and quality,
- ability to prepare and implement a work plan and program.

d) Autonomy and responsibility

- suitability for self-employment,
- creativity,

- professional opinion creation and effective communication,
- ability to use and analyse information,
- environmentally conscious behaviour,
- compliance with environmental regulations,
- professional responsibility,
- aptitude for cooperation, after conducting good practice to perform managerial tasks.

Among the scientific work in the Faculty, the work of the Food Engineer MSc in English is also linked to the work of several institutes in the following areas:

- objective qualification methods for raw materials, semi-finished and finished products in the food industry, composition analysis of raw materials, quality assurance, and improvement,
- production and product development research, assortment expansion, product quality, packaging, shelf life improvement,
- production of advanced nutrition-physiologically beneficial food products, enhancement of the value of food, utilization of by-products,
- food industry environmental management research, processing losses, pollution, reducing environmental impact, waste management,
- to reduce the fungal infection of plant-derived materials by various milling techniques,
- development of natural, plant-based antioxidants and preservatives,
- food safety,
- agro-business.

The duration of the traineeship placement is at least 4 weeks, defined by the higher education institution's curriculum.

Foreign language requirements in Hungary: To obtain a master's degree in any living foreign language, in which the profession has a scientific literature, a state-recognized, intermediate-level (B2) complex type exam or equivalent maturity certificate or diploma. In Romania, the University of Oradea stands requirements.

#### Conditions for admission to Master's degree:

At least 60–84 credits can be recognized on the basis of a comparison of the knowledge on which the student is based, as defined in the Higher Education Act.

## Agreed frames about collaboration

Negotiations and preparations were completed in January 2019, with the Joint Food Engineer MSc subject network available as an acceptable and feasible alternative for both universities (Oradea University Faculty of Environmental Protection, University of Szeged Faculty of Engineering).

We have the necessary data, so after final consultation, we hope to be the basis for our joint education.

### Some principles are fixed:

- a) In Oradea - typically - with a higher credit number the subjects are run, so they can be matched with the subject of several names from the Szeged network – occasionally;
- b) the scheduling of each university's subject network will be changed because it seems appropriate to designate 2<sup>nd</sup> semester for mutual mobility;
- c) the most important subjects for the given institution - and if equivalence - could be taught by both institutions themselves;
- d) the summary study does not address the financing issues, and later dean consultation will be needed on this issue. For the time being, it is not known how symmetrical the training and the licensing process (students should always receive a formal certificate / deposit from their other university) attesting to their participation in joint training.

### Curriculums in joint programme

Harmonized curriculum is the result of two partner-universities curriculum (study programmes). In annex you can find original curriculums of University of Szeged Faculty of Engineering and Oradea University Faculty of Environmental Protection.

After it you can find a list of course descriptions, which are common in joint degree programme and can be learnt by students in partner university (cross-education) in the same **second semester**.

We had to make some changes in row of courses, someone are a semester before or later.

### Curriculum in joint programme

Subjects <i>Language: English</i>	Semesters				Credits	Exam / term mark / other)
	1 <sup>st</sup>	2 <sup>nd</sup> for mobility	3 <sup>rd</sup>	4 <sup>th</sup>		
classes/week, types (lecture (lec) / practical course (pc))						
<b>BASIC MODULE / Compulsory</b>						
1. Applied Statistics	1/15 lec 1/15 pc				2	term mark
2. Food Physical Chemistry	2/30 lec 1/15 pc				4	exam
3. Fundamentals of Nutrition Science	2/30 lec				3	qualification (3 grade)
4. Transport Phenomena in Food Industry			2/30 lec 2/30 pc	2/30 lec 2/30 pc	5, 4	exam, exam
5. Food Process Organization	1/15 lec 1/15 pc				2	qualification (3 grade)
6. Quality Management 6. HACCP System on Food Industry		2/30 lec 1/15 pc			5	exam





<b>Total:</b>	<i>6/90 lec, 3/45 pc</i>	<i>2/30 lec, 1/15 pc</i>	<i>2/30 lec, 2/30 pc</i>	<i>2/30 lec 2/30 pc</i>	<b>25</b>	<b>4 exams, 2 qualifications (3 grade), 1 term mark</b>
<b>PROGRAMME SPECIFIC CORE MODULE / Compulsory</b>						
1. Food Safety HU 1. Food Safety RO		<i>2/30 lec 1/15 pc</i>			<b>5</b>	<i>exam</i>
2. General Food Technology 2. Modern Preservation Methods in Food Industry		<i>1/15 lec 2/30 pc</i>			<b>5</b>	<i>exam</i>
3. Biotechnology	<i>2/30 lec</i>				<b>3</b>	<i>qualification (3 grade)</i>
4. Planning of Food Plants			<i>1/15 lec 1/15 pc</i>		<b>2</b>	<i>exam</i>
5. Food Measurement and Automation	<i>2/30 lec 1/15 pc</i>				<b>3</b>	<i>term mark</i>
6. Fundamentals of Environment Management	<i>2/30 lec 1/15 pc</i>				<b>3</b>	<i>exam</i>
7. Marketing HU 7. Marketing of Ecology and Agri- Food Process		<i>2/30 lec 1/15 pc</i>			<b>5</b>	<i>exam</i>
8. Food Economics and Management 8. Management of the Food Industry Projects		<i>2/30 lec 1/15 pc</i>			<b>5</b>	<i>exam</i>



<b>Total:</b>	<b>6/90 lec, 2/30 pc</b>	<b>7/105 lec, 5/75 pc</b>	<b>1/15 lec, 1/15 pc</b>	<b>2/30 lec</b>	<b>31</b>	<b>6 exams, 1 qualificatio ns (3 grade), 1 term mark</b>
<b>PROGRAMME SPECIFIC MODULE / Compulsory</b>						
1. Food Technology	3/45 lec 2/30 pc		3/45 lec 2/30 pc	3/45 lec 2/30 pc	5, 5, 4	exam, exam, exam
2. Food Machinery	1/15 lec 1/15 pc		1/15 lec 1/15 pc		2, 2	qualificatio n (3 grade), qualificatio n (3 grade),
3. Food Packaging			2/30 lec		2	qualificatio n (3 grade)
4. Food Qualification 4. Impact Factors Upon the Quality of Raw Materials		1/15 lec 2/30 pc			5	exam
5. Product Development, Innovation			2/30 lec	2/30 lec	2, 2	exam, exam
6. The Basic Elements of Law	2/30 lec				3	qualificatio n (3 grade)
7. Alternative Food Processing Technologies				2/30 lec 1/15 pc	2	exam
<b>Total:</b>	<b>6/90 lec 3/45 pc</b>	<b>1/15 lec, 2/30 pc</b>	<b>8/120 lec, 3/45 pc</b>	<b>7/105 lec, 3/45 pc</b>	<b>34</b>	<b>7 exams, 4 qualificatio ns (3 grade), 0 term mark</b>
<b>Internship</b>			4 weeks, after the 2nd semester		0	signature

<b>Thesis Work</b>			<i>8/120 pc</i>	<i>12/180 pc</i>	<b>12, 18</b>	<i>qualificatio n (3 grade), qualificatio n (3 grade)</i>
<b>Credits</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>120</b>	

**Annexes**

**Annex 1.** Curriculum of Food Science and Technology Engineer MSc of University of Szeged Faculty of Engineering

Subjects	Semesters				Credits	Examinations, qualifications and colloquiums
	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>		
	classes (week/ semester), types (C – Course, S – Seminar, L – Practical (laboratory), P – Project) or types (lecture (lec) / practical course (pc))					
<i>alapozó ismeretek / BASIC MODULE / Compulsory</i>						
1. Applied Statistics <b>Zsuzsanna Hovorkáné Horváth</b>		1/15 lec 1/15 pc			2	term mark
2. Food Physical Chemistry <b>Miklós Kálmán</b>	2/30 lec 1/15 pc				3	exam
3. Fundamentals of Nutrition Science <b>Andrea Szabóné Nagy</b>	2/30 lec				2	qualification (3 grade)
4. Transport Phenomena in Food Industry <b>Cecília Hodúr</b>		2/30 lec 2/30 pc	2/30 lec 2/30 pc		5, 5	exam, exam
5. Food Process Organization <b>Cecília Hodúr</b>		1/15 lec 1/15 pc			2	qualification (3 grade)
6. Quality Management <b>Pál Molnár</b>			2/30 lec	2/30 lec	2, 2	exam, exam

<b>Total:</b>	4/60 <i>lec</i> , 1/15 <i>pc</i>	4/60 <i>lec</i> , 4/60 <i>pc</i>	4/60 <i>lec</i> , 2/30 <i>pc</i>	2/30 <i>lec</i>	23	5 exams, 2 qualifications (3 grade), 1 term mark
<b>szakmai törzsanyag / PROGRAMME SPECIFIC CORE MODULE / Compulsory</b>						
1. Food Safety <b>Judit Krisch</b>	2/30 <i>lec</i> 1/15 <i>pc</i>				4	exam
2. General Food Technology <b>József Csanádi,</b> <b>Balázs P. Szabó</b>	2/30 <i>lec</i> 1/15 <i>pc</i>	2/30 <i>lec</i> 1/15 <i>pc</i>			4, 3	exam, exam
3. Biotechnology <b>Judit Krisch</b>		2/30 <i>lec</i>			2	qualification (3 grade)
4. Planning of Food Plants <b>Ernő Gyimes</b>			1/15 <i>lec</i> 1/15 <i>pc</i>		2	exam
5. Food Measurement and Automation <b>József Sárosi</b>	2/30 <i>lec</i> 1/15 <i>pc</i>				3	term mark
6. Fundamentals of Environment Management <b>Zsuzsanna László</b>	2/30 <i>lec</i> 1/15 <i>pc</i>				3	exam
7. Marketing <b>József Gál</b>	2/30 <i>lec</i>				2	qualification (3 grade)
8. Food Economics and Management <b>József Gál</b>				2/30 <i>lec</i>	2	qualification (3 grade)
<b>Total:</b>	10/150 <i>lec</i> , 4/60 <i>pc</i>	4/60 <i>lec</i> , 1/15 <i>pc</i>	1/15 <i>lec</i> , 1/15 <i>pc</i>	2/30 <i>lec</i>	25	5 exams, 3 qualifications (3 grade), 1 term mark
<b>differenciált szakmai ismeretek / PROGRAMME SPECIFIC MODULE / Compulsory</b>						
1. Food Technology <b>József Csanádi,</b> <b>Ferenc Eszes</b> (animal raw materials processing); <b>Balázs P. Szabó,</b> <b>Antal Véha, Ernő</b> <b>Gyimes</b> (food vegetable raw materials processing)		3/45 <i>lec</i> 2/30 <i>pc</i>	3/45 <i>lec</i> 2/30 <i>pc</i>	3/45 <i>lec</i> 2/30 <i>pc</i>	5, 5, 5	exam, exam, exam

2. Food Machinery <b>József Csanádi, Ferenc Eszes (animal raw materials processing); Balázs P. Szabó, Antal Véha, Ernő Gyimes (food vegetable raw materials processing)</b>		1/15 lec 1/15 pc	1/15 lec 1/15 pc	1/15 lec 1/15 pc	2, 2, 2	qualification (3 grade), qualification (3 grade), qualification (3 grade)
3. Food Packaging <b>Ernő Gyimes</b>			2/30 lec		2	qualification (3 grade)
4. Food Qualification <b>Gabriella Zsarnóczay</b>			1/15 lec 1/15 pc		2	term mark
5. Product Development, Innovation <b>Judit Krisch</b>			2/30 lec	2/30 lec	2, 2	exam, exam
6. The Basic Elements of Law <b>Judit Siket</b>	2/30 lec				2	qualification (3 grade)
7. Alternative Food Processing Technologies <b>Ernő Gyimes</b>				2/30 lec 1/15 pc	3	exam
<b>Total:</b>	2/30 lec	4/60 lec, 3/45 pc	9/135 lec, 4/60 pc	8/120 lec, 4/60 pc	34	6 exams, 5 qualifications (3 grade), 1 term mark
<b>Internship</b>			4 weeks, after the 2nd semester		0	signature
<b>Thesis Work</b>			8/120 pc	12/180 pc	12, 18	qualification (3 grade), qualification (3 grade)

**Annex 2.** Curriculum of Food Science and Technology Engineer MSc of Oradea University  
Faculty of Environmental Protection

Subjects	Semesters				Credits	Examinations and colloquiums
	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>		
	classes (week/ semester), types (C – Course, S – Seminar, L – Practical (laboratory), P – Project)					
<b>alapozó ismeretek / BASIC MODULE / Compulsory</b>						
1. Modern Methods to Ensure Hygiene in Agri-Food Industry	2/28 C 1/14 L				6	exam
2. Inocuity of Agri-Food Peoducts	1/28 C 1/14 L				6	exam
3. Optic and Chromatographic Methods in Food Industry	1/14 C 2/28 L				6	exam
4. Modern Preservation Methods in Food Industry	1/14 C 1/14 L 1/14 P				6	exam
5. Food Safety	2/28 C 1/14 L				6	exam
<b>Total:</b>	<b>7/98 C 6/84 L 1/14 P</b>				<b>30</b>	<b>5 exams</b>
6. Microbilologic Control of Agri-Food Products		2/28 C 1/14 L			4	exam
7. Modern Processing Methods in Food Industry		1/14 C 1/14 L			3	exam
8. Overall Politics and Strategy for Food Security		2/28 C 1/14 S			4	exam

9. Impact Factors upon the Quality of Raw Materials		1/14 C 2/28 L			4	exam
10. Marketing of Ecologic Agri-Food Products		2/28 C 1/14 S			4	exam
11. Practice					10	colloquium
12. Ethics and Integrity in Scientific Research		1/14 C			1	exam
<b>Total:</b>		9/126 C 2/28 S 4/56 L			30	6 exams, 1 colloquium
13. Informatics Applied in Food Industry			1/14 C 1/14 L		5	colloquium
14. Traceability of Agri-Food Products			1/14 C 1/14 L		5	exam
15. Management of Agri-Food Products Quality			2/28 C 1/14 L		5	colloquium
16. Modern Processing Methods on Bakery and Milling			2/28 C 1/14 L		5	exam
<b>Total:</b>			6/84 C 4/56 L		20	2 exams, 2 colloquiums
17. Management of the Food Industries Project (Option no1)				1/14 C 1/14 L	5	exam
18. HACCP System on Food Industry (Option no1)				1/14 C 1/14 L	5	exam
19. Genetically Modified Organisms Used for Consumption (Option no2)				1/14 C 1/14 L	5	exam
20. Metabolism-Related By-Products Involved in the Provision of Agri-Food Product Quality (Option no2)				1/14 C 1/14 L	5	exam



<b>Total:</b>				2/28 C 2/28 L	<b>10</b>	2 exams
21. Practical Research Module and Practical Training for the Elaboration of Dissertation Thesis				14/196 P	30	1 colloquium
<b>Total:</b>	7/98 C 6/84 L 1/14 P	9/126 C 2/28 S 4/56 L	6/84 C 4/56 L	2/28 C 2/28 L 14/196 P	<b>120</b>	15 exams, 4 colloquiums

Legend: C – Course, S – Seminar, L – Practical (laboratory), P – Project; Type of examination: examination, colloquium.