

BULLETIN

UNIVERSITY OF DEBRECEN

ACADEMIC YEAR 2015/2016

**Faculty of Agricultural and Food Sciences and
Environmental Management**

FOOD SAFETY AND QUALITY MSc

Coordinating Center for International Education

Table of Contents

UNIVERSITY OF DEBRECEN.....	4
DEAN'S WELCOME.....	5
HISTORY OF THE FACULTY.....	6
MISSION OF THE FACULTY.....	7
THE ORGANIZATIONAL STRUCTURE OF THE UNIVERSITY.....	8
THE DEPARTMENTS OF THE FACULTY.....	9
UNIVERSITY CALENDAR.....	16
FOOD SAFETY AND QUALITY MSC PROGRAMME.....	17
CURRICULUM OF THE FULL TIME PROGRAMME.....	18
COURSE DESCRIPTIONS.....	25

CHAPTER 1

UNIVERSITY OF DEBRECEN

Date of Foundation: 1912 Hungarian Royal University of Sciences 2000 University of Debrecen

Legal predecessors: Debrecen University of Agricultural Sciences Debrecen Medical University Wargha István College of Education, Hajdúböszörmény Kossuth Lajos University of Arts and Sciences

Legal status of the University of Debrecen: state university

Founder of the University of Debrecen: Hungarian State Parliament

Supervisory body of the University of Debrecen: Ministry of Education

Accreditation dates and statute numbers: Debrecen University of Agricultural Sciences: 17 December 1996, MAB/1996/10/II/1. Debrecen Medical University: 5 July 1996, OAB/1996/6/II/6 Wargha István College of Education, Hajdúböszörmény: 5 July 1996, OAB/1996/6/II/2 Kossuth Lajos University of Arts and Sciences: 5 July 1996, OAB/1996/6/II.5. University of Debrecen: 3 October 2012, MAB/2012/8/VI/2.

Number of Faculties at the University of Debrecen: 14

- Faculty of Law
- Faculty of Medicine
- Faculty of Humanities
- Faculty of Health
- Faculty of Dentistry
- Faculty of Economics and Business (before 1 August 2014 the predecessors of the Faculty were the Faculty of Applied Economics and Rural Development and the Faculty of Economics and Business Administration)
- Faculty of Child and Adult Education
- Faculty of Pharmacy
- Faculty of Informatics
- Faculty of Agricultural and Food Sciences and Environmental Management (before 1 March 2010 the name of the Faculty was the Faculty of Agriculture)
- Faculty of Engineering
- Faculty of Public Health
- Faculty of Sciences and Technology
- Faculty of Music

Number of accredited programmes at the University of Debrecen: 73 degree programmes with the pre-Bologna 5-year-system university education, 41 supplementary degree programmes offering transfer-degree continuation of studies towards the university degree (MSc), 50 degree programmes with the pre-Bologna 3-year-system college education, 67 BSc and 78 MSc programmes according to the Bologna system, 5 unified one-cycle linear training programmes, 35 specializations offering post-secondary vocational certificates and 159 vocational programmes.

Number of students at the University of Debrecen: 28812

according to time of studies: 22888 full-time students, 5899 part-time students having corresponding classes and 25 part-time students having evening classes or distance education according to education level: 944 students at post-secondary vocational level, 17406 students at BSc, 3112 students at MSc, 21 students at college level, 190 students at university level (MSc), 5320 students at one-cycle linear training, 954 students at vocational programmes, 865 students at PhD, 3741 foreign students.

Full time teachers of the University of Debrecen: 1421

194 full college/university professors and 1055 lecturers with a PhD.

CHAPTER 2

DEAN'S WELCOME

Thank you for your interest in our university with a great past and in our agricultural higher education with approximately 150 year old traditions.

The University of Debrecen is one of the institutions offering a wide range of courses and research activities in Hungary. As one of the most significant think tanks in the country and the knowledge centre of the region, we seek to provide unprecedented opportunities for our students to gain state-of-the-art knowledge and to carry out significant activities.

With excellent infrastructure and high level education, the Faculty of Agricultural and Food Sciences and Environmental Management ensures excellent facilities for its students. In addition to gaining in-depth modern experience, a wide range of opportunities are available to perform professional and scientific activities beyond the scope of academic studies. After obtaining their certificates in higher education vocational training and BSc diploma courses, our students acquire a thorough practical knowledge, they can continue their studies in MSc training and then the best ones in Ph.D. training.

We firmly believe that the variety of trainings and courses we offer are attractive to many students who choose the Faculty of Agricultural and Food Sciences and Environmental Management for academic education.

I wish you every success in your studies and hope to meet you personally in the near future.

Prof. Dr. István Komlósi
Dean

CHAPTER 3 HISTORY OF THE FACULTY

History of the Faculty

Agricultural higher education in Debrecen started in 1868 with the foundation of the National Higher Economic School of Debrecen. This date marks the beginning of agricultural higher education in Debrecen and East Hungary. Between 1876 and 1906 the institute's official name was Secondary Economic School. Then it was run under the name Hungarian Royal Academy of Economy until 1944. Between 1944 and 1949 our institute went on with its work as the Debrecen Department of the Agricultural Sciences at the Hungarian Agricultural University. In 1953 tuition began again at the Agricultural Academy. Training of professionals reached University level between 1962 and 1970 at the Agricultural College. Between 1970 and 1999 the institute got its university title and as the Agricultural University of Debrecen it operated with two branch faculties (Szarvas, earlier Hódmezővásárhely, later Mezőtúr).

The University of Debrecen was established with 5 university-, three college faculties and three research institutes on 1st January, 2000. In 2002 the Faculty of Agriculture and Rural Development was established, and by 2006, the university had comprised 15 faculties.

CHAPTER 4

MISSION OF THE FACULTY

Mission of the Faculty

The mission of the Faculty of Agricultural and Food Sciences and Environmental Management is the multifunctional development of agriculture and rural development in the North Great Plain Region. Accordingly, the institution deals with regional, national and international research and consultancy, as well as the primary goal of training professionals within the Center for Agricultural and Applied Economic Sciences. Our spectrum of educational, training and research areas have broadened, in compliance with the demands of sustainable agricultural and rural development. The interconnection between the branches of science is strengthening, which is desirable both in the long and the short terms. Our aspiration can be used as a motto, as well: "diverse training and mobility".

Our Faculty provides all the personal and infrastructural conditions of linear training. The structure of our educational programs is flexible and provides students with diverse course contents.

Our accredited laboratories provide us with the opportunity to impact sectors of the economy in such a way that these can meet the ever-changing demands on markets. Our purpose is to create high-standard student and research laboratories and to provide the conditions for special high-value machines and measurement processes.

The doctoral schools and doctoral programs operating at the Faculty have an ever-widening base - providing talented young people with a suitable environment for scientific development.

CHAPTER 5

THE ORGANIZATIONAL STRUCTURE OF THE UNIVERSITY

RECTOR OF THE UNIVERSITY OF DEBRECEN

Rector: Zoltán Szilvássy M.D., Ph.D, D.Sc.
Address: 4032 Debrecen, Egyetem tér 1.
Phone: +36-52-412-060
Phone/Fax: +36-52-416-490
E-mail: rector@unideb.hu

FACULTY OF AGRICULTURAL AND FOOD SCIENCES AND ENVIRONMENTAL MANAGEMENT

Dean: Prof. Dr. habil. István Komlósi
Address: 4032 Debrecen, Böszörményi út 138.
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Fax: +36-52/486-292
E-mail: komlosi@agr.unideb.hu

Vice Dean for Educational Affairs: Dr. habil. Csaba Juhász
Address: 4032 Debrecen, Böszörményi út 138.
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Vice Dean of Scientific Affairs: Dr. László Stündl
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Fax: +36-52/486-292
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DEAN'S OFFICE

Head of Dean's Office: Dr. Mrs. Julianna Fricz Mocsári
Address: 4032 Debrecen, Böszörményi út 138.
Phone/Fax: +36-52/508-412, +36-52/508-489
E-mail: friczj@agr.unideb.hu

REGISTRAR'S OFFICE

Registrar: Dr. Mrs. István Kovács
Address: 4032 Debrecen, Böszörményi út 138.
Phone/Fax: +36-52/508-409, +36-52/508-317
E-mail: ktunde@agr.unideb.hu

Officers
Mrs. Gizella Kerekes Guthy
Mrs. Mónika Bátori Pintye
Ms. Zsuzsanna Házi
László Lévai

CHAPTER 6
THE DEPARTMENTS OF THE FACULTY

INSTITUTE OF AGRICULTURAL CHEMISTRY AND SOIL SCIENCE

Böszörményi út 138., Debrecen, 4032

Full Professor, Head of Institute	János Kátai C.Sc.
Associate Professor	Ms. Andrea Balláné Kovács Ph.D. Ms. Mária Micskeiné Csubák C.Sc. Imre Vágó C.Sc.
Assistant Professor	Ms. Rita Erdei Kremper Ph.D. Ms. Sándorné Kincses Ph.D. Zsolt Sándor Ph.D.
Secretary	Ms. Gizella Szász
Research Assistant	Ms. Magdolna Tállai Ph.D.

**INSTITUTE OF ANIMAL SCIENCE, BIOTECHNOLOGY AND NATURE
CONSERVATION**

Böszörményi út 138., Debrecen, 4032

Full Professor, Head of Institute	István Komlósi D.Sc.
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Department of Animal Husbandry

Böszörményi út 138., Debrecen, 4032

Full Professor, Dean, Head of Department	István Komlósi D.Sc.
Professor Emeritus	Imre Bodó D.Sc. Sándor Mihók C.Sc.
Professor	János Gundel C.Sc.
Technical Assistant	Ms. Beáta Babka Ms. Gabriella Gulyás Attila Sztrik
Associate Professor	Béla Béri C.Sc. Károly Magyar C.Sc. Ms. Gabriella Novotniné Dankó Ph.D. József Prokisch Ph.D. László Stündl Ph.D.

CHAPTER 6

Assistant Lecturer	Ms. Nóra Pálfyné Vass Ph.D.
Assistant Professor	Péter Bársony Ph.D. Levente Czeglédi Ph.D.
	Ms. Anna Pécsi Ph.D. János Posta Ph.D.
Secretary	Sándor Boros Ms. Ágnes Gere Ms. Károlyné Kiss Ms. Marianna Korcsmárosné Varga Ms. Anikó Nagy

Department of Nature Conservation, Zoology and Game Management Böszörményi út 138., Debrecen, 4032

Head of Department	Lajos Juhász Ph.D.
Assistant Research Fellow	László Kövér Ph.D.
Professor	Károly Rédei D.Sc.
Technical Assistant	Norbert Tóth
Assistant Professor	Péter Gyüre Ph.D. Lajos Kozák Ph.D. László Szendrei Ph.D.

Department of Animal Nutrition and Food Biotechnology Böszörményi út 138., Debrecen, 4032

Head of Department	László Babinszky Ph.D.
Associate Professor	Csaba Szabó Ph.D.
Senior Lecturer	Ms. Judit Gálné Remenyik Ph.D.

Animal Genetics Laboratory Böszörményi út 138., Debrecen, 4032

Head of Department	András Jávora C.Sc.
Professor	András Kovács D.Sc.
Assistant Lecturer	Ms. Zsófia Rózsáné Várszegi Ph.D.
Senior Research Fellow	Ms. Szilvia Kusza Ph.D.

INSTITUTE OF FOOD SCIENCE

Böszörményi út 138., Debrecen, 4032

Full Professor, Head of Institute	Béla Kovács Ph.D.
Professor	János Csapó D.Sc.
Technical Assistant	Ms. Éva Bacskainé Bódi
	Ms. Andrea Tóthné Bogárdi
Associate Professor	Ms. Erzsébet Karaffa Ph.D.
	Péter Sipos Ph.D.
Assistant Lecturer	Ms. Diána Ungai Ph.D.
Assistant Professor	Ms. Nikolett Czipa Ph.D.
	Ferenc Peles Ph.D.
Secretary	Ms. Tünde Simon

INSTITUTE FOR LAND UTILISATION, TECHNOLOGY AND REGIONAL DEVELOPMENT

Böszörményi út 138., Debrecen, 4032

Head of Institute	János Nagy D.Sc.
Professor	Béla Baranyi D.Sc.
	Gyula Horváth D.Sc.
Associate Professor	Zoltán Hagymássy Ph.D.
	Endre Harsányi Ph.D.
	Tamás Rátonyi Ph.D.
Assistant Professor	Imre Andorkó Ph.D.
	Ms. Adrienn Széles Ph.D.
	András Vántus Ph.D.
Senior Research Fellow	Attila Csaba Dobos Ph.D.
Secretary	Ms. Zsuzsanna Dorogi
	Ms. Sándorné Széles

INSTITUTE OF HORTICULTURE

Böszörményi út 138., Debrecen, 4032

Head of Institute	Imre Holb D.Sc.
Assistant Research Fellow	Ferenc Abonyi
Associate Professor	Ms. Mária Takácsné Hájos C.Sc.

CHAPTER 6

Assistant Lecturer	Ádám Csihon
	Péter Dremák Ph.D.
Assistant Professor	Nándor Rakonczás Ph.D.
Secretary	Ms. Andrea Gátiné Laskai

INSTITUTE OF CROP SCIENCES Böszörményi út 138., Debrecen, 4032

Head of the Institute	Péter Pepó D.Sc.
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Department of Landscape Ecology Böszörményi út 138., Debrecen, 4032

Head of Institute	Péter Pepó D.Sc.
Professor	Mihály Sárvári D.Sc.
Associate Professor	József Csajbók Ph.D.
Assistant Lecturer	Ms. Adrienn Novák Ph.D.
	Ms. Enikő Vári Ph.D.
Assistant Professor	Lajos Fülöp Dóka Ph.D.
	Ms. Erika Kutasy Ph.D.
	András Szabó Ph.D.
Secretary	Ms. Gyöngyi Kovács
	Ms. Endréné Szendrei

Department of Plant Biotechnology Böszörményi út 138., Debrecen, 4032

Professor	Miklós Gábor Fári D.Sc.
Associate Professor	Ms. Szilvia Veres Ph.D.
Assistant Lecturer	Ms. Szilvia Kovács
	Ms. Brigitta Tóth Ph.D.
Assistant Professor	Ms. Éva Domokosné Szabolcsy Ph.D.
	Ms. Zsuzsanna Lisztes-Szabó Ph.D.
	Péter Makleit Ph.D.

Genetics Group

Böszörményi út 138., Debrecen, 4032

Head Pál Pepó C.Sc.

INSTITUTE OF PLANT PROTECTION

Böszörményi út 138., Debrecen, 4032

Head of Institute György János Kövics C.Sc.

Associate Professor András Bozsik C.Sc.

László Radócz C.Sc.

Assistant Professor Antal Nagy Ph.D.

Senior Research Fellow Gábor Tarcali Ph.D.

Secretary Ms. Tünde Szabóné Asbolt

AGRICULTURAL LABORATORY CENTRE

Böszörményi út 138., Debrecen, 4032

Assistant Research Fellow Ms. Nóra Óri

Technical Assistant Ms. Nóra Bessenyei Tarpay
Csaba Kiss

Ms. Hajnalka Pákozdy

Ms. Istvánné Sörös

Gábor Tóth M.D.

Associate Professor Ms. Tünde Pusztahelyi Ph.D.

INSTITUTE OF WATER AND ENVIRONMENTAL MANAGEMENT

Böszörményi út 138., Debrecen, 4032

Deputy Head Csaba Juhász Ph.D.

Head of Institute János Tamás D.Sc.

Assistant Research Fellow Péter Riczu

Ms. Nikolett Szöllősi

Professor Lajos Blaskó D.Sc.

Technical Assistant Ms. Kamilla Berényi-Katona

Ms. Katalin Bökfí

Associate Professor Ms. Elza Kovács Ph.D.

Assistant Lecturer Ms. Tünde Fórián Ph.D.

	Ms. Ildikó Gombosné Nagy Ph.D.
	Ms. Lili Mézes Ph.D.
Assistant Professor	Attila Nagy Ph.D.
	Csaba Pregun Ph.D.
Secretary	Ms. Imre Lászlóné Huszka
	Ms. Zsuzsanna Szathmáriné Pongor

FACULTY OF ECONOMICS AND BUSINESS

Böszörményi út 138., Debrecen, 4032

Assistant Research Fellow	Zoltán Győri Ph.D.
Professor	Csaba Berde C.Sc.
	Miklós Herdon Ph.D.
	András Nábrádi MBA, C.Sc.
	Géza Nagy C.Sc.
	József Popp D.Sc.
	Zoltán Szakály C.Sc.
College Professor	Ferenc Kalmár Ph.D.
	Ms. Edit Gizella Szűcs Ph.D.
Associate Professor	Péter Balogh Ph.D.
	Zsolt Csapó Ph.D.
	Wiwczarowski Dr. Troy B. Ph.D.
	János Felföldi Ph.D.
	István Grigorszky Ph.D.
	Ms. Csilla Juhász Ph.D.
	Levente Karaffa Ph.D.
	István Kuti C.Sc.
	László Lakatos Ph.D.
	Ms. Ilona Nagyné Polyák Ph.D.
	Miklós Pakurár Ph.D.
	Károly Pető C.Sc.
	László Posta C.Sc.
	Sándor Szűcs C.Sc.
	István Szűcs Ph.D.
Assistant Lecturer	Ms. Mónika Harangi-Rákos
Assistant Professor	Ms. Andrea Bauerné Gáthy Ph.D.

THE DEPARTMENTS OF THE FACULTY

Zoltán Csiki M.D., Ph.D.

Ms. Zita Hajdu Ph.D.

Ms. Judit Katonáné Kovács Ph.D.

Sándor Kovács Ph.D.

Ms. Ildikó Tar Ph.D.

Ferenc Buzás Ph.D.

Research Fellow

CHAPTER 7

UNIVERSITY CALENDAR

Academic calendar

2015/2016

Events	Dates
Opening Ceremony	September 6 (Sunday)
Enrolment week	September 7 - 11
Study period for not final year students	September 14 - December 18 (14 weeks)
Study period for final year students	September 14 - November 13 (9 weeks)
Deadline for thesis submission	October 30
Examination period for final year students	November 16 - December 4 (3 weeks)
Examination period for not final year students	December 21 – February 5 (7 weeks)
Defending of the thesis	November 30 – December 1
Final exam	December 10 - 11
Graduation ceremony	December 19
Enrolment week	February 8 - 12
Study period for not final year students	February 15 – May 20 (14 weeks)
Study period for final year students	February 15 - April 22 (10 weeks)
Deadline of the thesis	April 22
Examination period for final year students	April 25 – May 20 (4 weeks)
Examination period for not final year students	May 23 - July 8 (7 weeks)
Defending of the thesis	May 26 - 27
Final exam	June 6 - 7
Graduation ceremony	June 18

CHAPTER 8

FOOD SAFETY AND QUALITY MSC PROGRAMME

FOOD SAFETY AND QUALITY MSc PROGRAMME

About the course:

The MSc in Food Safety and Quality is designed to develop your undergraduate knowledge and improve it through application and research. The field of Food Science is broad and the programme reflects this diversity, with emphasis on Raw Material Qualifying, Processing Technology, Quality Analysis and Quality Assurance.

Requirements:

Application requirements: BSc degree or higher in Food Engineering, Chemical Engineering, Biological Science, Agronomy. BSc degree or higher in a chemically and biologically related degree. Other approved accreditation or professional qualification. Upper-intermediate English language certificate.

Length of the Study programme: Two year full-time taught programme plus dissertation. Presently no part-time options are available.

Number of ECTS credits: 120

The course consists of lectures and seminars. Attendance at lectures is recommended, but not compulsory. Participation at practice classes is compulsory. A student must attend the practice classes and may not miss more than three times during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. A student can't make up a practice class with another group. The attendance at practice classes will be recorded by the practice leader. Being late is equivalent with an absence. In case of further absences, a medical certificate needs to be presented. Missed practices should be made up for at a later date, being discussed with the tutor. Active participation is evaluated by the teacher in every class. If a student's behavior or conduct doesn't meet the requirements of active participation, the teacher may evaluate his/her participation as an absence because of the lack of active participation in class.

The knowledge of the students will be tested several times depending on the class types during the entire course. The training ends in a Final Exam (FE) of the whole semester material and a minimum of four FE dates will be set during the examination period. Unsuccessful students may repeat

During the semester there are two tests: the mid-term test in the 8th week and the end-term test in the 15th week. Students have to sit for the tests.

Tests are evaluated according to the followings:

Score Grade

0-59 fail (1)

60-69 pass (2)

70-79 satisfactory (3)

80-89 good (4)

90-100 excellent (5)

absence for any reason counts as 0%.

If the score of any test is below 60, the student can take a retake test in conformity with the EDUCATION AND EXAMINATION RULES AND REGULATIONS.

An offered grade: It may be offered for the students if the average of the mid-term and end-term tests is at least good (4). The offered grade is the average of them.

Careers:

Postgraduates may progress to PhD or find employment in food and dietetics science research, lecturing, consultancy or other science-based sectors of the food science industry. Our institute has a good relationship with food processing and qualifying enterprises and government organizations of the region.

CHAPTER 9

CURRICULUM OF THE FULL TIME PROGRAMME

Compulsory courses														Prerequisites of taking the subject
1. year														
Subjects	Neptun code	1 st semester						2 nd semester						
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.			
Biochemical bases of products' quality	MTMEE032						2					ESE	2	None
Dissertation I.	MTMEE036										5	AW5	5	None
Environmental aspects of food processing	MTMEE011						3					ESE	3	None
Ethical and legal issues of biotechnology	MTMEE012						2					ESE	2	None
Expectations to foodstuffs, consumer protection	MTMEE005	1			ESE	2								None
Food toxicology	MTMEE013						3					ESE	4	None
Marketing, accounting and finance	MTMEE010						2				2	ESE	4	None
Medicinal plants and their processing	MTMEE029						1				3	AW5	2	None

Compulsory courses														Prerequisites of taking the subject
1. year (continued)														
Subjects	Neptun code	1 st semester						2 nd semester						
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.			
Microbiological aspects of food quality and safety	MTMEE008						2		2		ESE	4		None
Modern methods of analysis I. (Spectroscopy)	MTMEE002	1		4	ESE	5								None
Modern methods of analysis II. (Separation techniques)	MTMEE007						1		4		AW5	5		None
Molecular biology	MTMEE006	2		2	ESE	5								None
Nutritional Sciences	MTMEE003			1	ESE	3								None
Packaging technology	MTMEE026	2			AW5	2								None
Quality and Safety of food technologies	MTMEE009						2		2		ESE	4		None
Quality assurance of measurement	MTMEE014						2				ESE	2		None

Compulsory courses														Prerequisites of taking the subject	
1. year (continued)															
Subjects	Neptun code	1st semester						2nd semester							
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.				
Quality control of biological bases	MTMEE031						2						ESE	3	None
Regulation of food production, quality and safety	MTMEE004	2		2	ESE	5									None
Theory of measuring and experimental designs	MTMEE001	2		2	ESE	5									None

Compulsory courses														Prerequisites of taking the subject	
2. year															
Subjects	Nepton code	1 st semester					2 nd semester					Crd.			
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.				
Analytical and microbiological rapid methods	MTMEE017	1		3	AW5	3									None
Dissertation II.	MTMEE037			4	AW5	10									None
Dissertation III.	MTMEE038									6		AW5	15		None
Food industry management and economics	MTMEE023										2		ESE	4	None
Food quality and safety risk analysis	MTMEE018	2		1	ESE	3									None
Food safety assessment of agrochemicals	MTMEE034	2			ESE	2									None
Hyphenated analytical methods	MTMEE015	1		1	ESE	3									None
managementInnovation	MTMEE019	2			ESE	2									None
Logistics in food chain	MTMEE025										2		ESE	2	None

Compulsory courses														Prerequisites of taking the subject	
2. year (continued)															
Subjects	Neptun code	1 st semester						2 nd semester							
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.				
Quality control, quality management	MTMEE016	3			ESE	3									None
Quality management systems	MTMEE020	3			ESE	4									None
Quality system audit	MTMEE024						2			1	ESE	3			None
Rheology in food testing	MTMEE021	1		1	AW5	2									None
Traceability in the food chain	MTMEE022						2			1	ESE	2			None

Required elective courses													Prerequisites of taking the subject
1. year													
Subjects	Neptun code	1 st semester					2 nd semester						
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.		
Comparative human and animal nutrition	MTMEE030						2		1	ESE	3		None
Extension knowledge	MTMEE028	3			ESE	2							None
Healthy Nutrition	MTMEE027	1		1	ESE	2							None
Meat and Milk Processing	MTMAE033-K3						2		1	ESE	3		None
Nutrition Therapy	MTMAE034-K2						2			ESE	2		None

Required elective courses													Prerequisites of taking the subject	
2. year														
Subjects	Neptun code	1 st semester					2 nd semester							
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.			
Biosensors in food analysis	MTMEE033	1			ESE	2								None
Quality evaluation of food proteins	MTMEE035					2					ESE	2		None

CHAPTER 10

COURSE DESCRIPTIONS

Agricultural Laboratory Centre

Subject: **REGULATION OF FOOD PRODUCTION, QUALITY AND SAFETY**

Year, Semester: 1st year/1st semester

Lecture: **2**

Practical: **2**

Requirements

Short course description:

General Food Law: general principles; transparency; obligations of food trade; food and feed safety requirements; traceability; European Food Safety Authority; Rapid Alert System, crisis management and emergencies.

Hazard Analysis and Critical Control Points.

Good Agricultural and Environmental Condition, Good Farming Practice.

Required reading materials

Regulation (EC) No 178/2002 of the European Parliament and of the Council

Codex Alimentarius Hungaricus

IFS/BRC/EFSIS standards

Genetics Group

Subject: **MOLECULAR BIOLOGY**

Year, Semester: 1st year/1st semester

Lecture: **2**

Practical: **2**

Requirements

Short course description:

Theory:

History and main elements of molecular biology, DNA and RNA: structure, synthesis, importance, isolation. Basics of plant biotechnology, first, second, third generation transgenic plants. Molecular plant breeding. Application of polymerase chain reaction in plant molecular genetics, molecular biology methods, sequencing, blotting techniques (hybridization), ELISA test.

Practice:

Morphological studies on chromosomes, karyotype, karyogram, mitosis, meiosis, application of molecular biological methods in own research. Electrophoresis, separation techniques.

Required reading materials

Bernard R. Glick and Jack J. Pasternak: Molecular biotechnology: principles and applications of recombinant DNA

2nd. Washington, D.C., 1998.

Bruce Alberts et al: Molecular biology of the cell

4th. New York: Garland Science, 2002.

S. H. Mantell et al: Principles of plant biotechnology: an introduction to genetic engineering in plants.

Oxford, Boston: Blackwell Scientific Publications, 1985.

Frederick M. Ausubel et al: Current protocols in molecular biology

New York: John Wiley&Sons, 1994.

Institute of Agricultural Chemistry and Soil Science

Subject: **NUTRITIONAL SCIENCES**

Year, Semester: 1st year/1st semester

Practical: **1**

Requirements

Short course description:

Fundamentals. Lectures examine the structures, properties and metabolism of four major classes of bio-organics (carbohydrates, lipids, proteins/ amino acids, nucleic acids/nucleotides) with special attention to their biologic roles and nutritional aspects of their metabolism, , vitamins, minerals and othert food sources; digestion; factors influencing bioavailability; absorption; transport; tissue uptake and distribution; food additives, the effects of foods from genetic modification, traditinal and organic production.

Required reading materials

Shils et al.: Modern Nutrition in Health and Disease

Lippincott Willims and Wilkins, 2005. ISBN: 0-7817-4133-5

Berg J., Tymoczko JL, Stryer L: Biochemistry

5th. San Francisco.W.H. Freeman, 2002. ISBN: 0716746840

Institute of Food Science

Subject: **EXPECTATIONS TO FOODSTUFFS, CONSUMER PROTECTION**

Year, Semester: 1st year/1st semester

Lecture: **1**

Requirements

Short course description:

Factors influencing marketability of foodstuffs: quality and safety. Regulation of quality and

conformity. Definition of materials and knowledge of wares. Specific (ethnic and religious) quality and nutrition habits (vegetarian, macrobiotic). Food security tasks of the government, market-regulation with food choice, health-oriented consumer behaviour. Domestic and international organisations for consumer protection.

Required reading materials

Hawkins D. I.-Best, R. J. -Coney, K. A. (Eds.): Consumer behavior, Implications for Marketing Strategy

BPI IRWIN, Homewood, Illinois, 1986.

Kenneth J. Meier-E. Thomas Garman- Lael R. Keiser: Regulation and Consumer Protection
Thomson Custom Publishing, 2003.

Subject: **MODERN METHODS OF ANALYSIS I. (SPECTROSCOPY)**

Year, Semester: 1st year/1st semester

Lecture: **1**

Practical: **4**

Requirements

Short course description:

Sampling procedures, Sample preparation methods, preservation of samples, opportunities of errors, general description of spectroscopic methods, Flame Emission Spectroscopy (FES), Flame Atomic Absorption Spectrometry (FAAS), Graphite Furnace Atomic Absorption Spectrometry (GF-AAS), Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES), Mass Spectrometry, Inductively Coupled Plasma Mass Spectrometry (ICP-MS). Comparison, evaluation and application of various analytical methods of elements. UV/VIS photometry. Equipments, methods, applications. Flow Injection Analysis (FIA). Infrared spectroscopy, atomic fluorescent spectroscopy, X-ray fluorescent- and gamma-spectrometry, analysis of ionizer radiations. Electron Spin Resonance Spectroscopy, Nuclear Magnetic Resonance Spectroscopy. Polarimetry. Refractometry. Application fields of the above methods for analysis of food samples.

Required reading materials

Belitz D., Grosch W., Schieberle P.: Food Chemistry
Springer Publish., 2004.

Boss, C. B. & Fredeen, K. J. : Concepts, instrumentation, and techniques in inductively coupled plasma optical emission spectrometry
Perkin Elmer, USA, 1997.

Cresser, M. S.: Flame spectrometry in environmental chemical analysis
The Royal Society of Chemistry. Cambridge, 1994.

Montaser, A.&Golightly, D. W.: Inductively coupled plasmas in analytical atomic spectrometry
VCH Publishers. New York., 1987.

Montaser, A. : Inductively coupled plasmas mass spectrometry
VCH Publishers, New York, 1998.

Skoog D. A., D. M. West, F. J. Holler: Fundamentals of analytical Chemistry
1992.

Subject: **PACKAGING TECHNOLOGY**

Year, Semester: 1st year/1st semester

Lecture: **2**

Requirements

Short course description:

Packaging material types (textile, wood, glass, paper and plastics) and the possibilities of combinations, associations. Quality and reliability of packaging. Packaging machines and tools. Environmental effects of packaging materials, re-use, re-cycling, re-filling. Diffusion and migration of packaging materials in contact with foodstuffs. Labelling of food articles. Mandatory and voluntary labelling, directions for use, advertisements.

Required reading materials

Biacs, P. A.: Overview of food packaging research in Hungary
1997.

G. L. Robertson : Food packaging an shelf life

Taylor & Francis Ltd., ISBN: 9781420078442

J. M. Vergnaud-I. D. Rosca : Assessing Food Safety of Polymer Packaging
Smithers Rapra Technology, 2006.

Subject: **THEORY OF MEASURING AND EXPERIMENTAL DESIGNS**

Year, Semester: 1st year/1st semester

Lecture: **2**

Practical: **2**

Requirements

Short course description:

The aim of the course is to provide an understanding of the principles of experimentation through studying various techniques of designing and analysing statistical experiments and surveys in application to biometrics. On completing this course students will: Understand the notion and requirements of a statistical experiment; Be able to develop a simple design of an experiment and analyse the following types of experimental design: Completely randomized; Randomised complete block; Latin square; Factorial experiments (including some elementary fractional factorials). Be able to select a suitable multiple comparison method and perform the formal statistical analysis. Design and test contrasts between factors of an experiment; Understand the basic concepts of sampling and survey; Have a good knowledge of various types of sampling procedures associated with biometrical problems. In practical sessions, examples and problems from many real-world applications will be used to gain an indepth knowledge of statistical techniques as well as the working knowledge of peculiarities of the data analysis.

Required reading materials

Clewer, A. G. and Scarisbrick, D. H.: Practical Statistics and Experimental Design for Plant and Crop Science

John Wiley&Sons, 2001.

Steel, R.G. and torrie J.H.: Principles and procedures of statistics

2nd. McGraw Hill, 1986.
Cochran, W. G.- Cox, G. M.: Experimental Designs
Wiley-Publications, New York USA, 1966.
Gomez, K. A. and Gomez A. A.: Statistical Procedures for Agricultural Research
John Wiley&Sons, 1984.
Cochran, W. G.: sampling techniques
3rd. John Wiley&Sons, 1977.
Zar, J. H. : Biostatistical analysis
Prentice-Hall, London, UK, 1999.

Agricultural Laboratory Centre

Subject: **MARKETING, ACCOUNTING AND FINANCE**

Year, Semester: 1st year/2nd semester

Lecture: **2**

Practical: **2**

Requirements

Description of knowledge this subject offers:

Basics of marketing. Market. Segmentation and positioning in the food industry. Product development. Life cycle management. Product policy. Price Policy. Distribution policy. Promotional policy.

Required reading materials

Philip Kotler-Gary Armstrong: Principles of Marketing

Pearson Prantice Hall, 2006.

Bauer András-Berács József: Marketing

Aula Könyvkiadó, 1998.

Department of Landscape Ecology

Subject: **QUALITY CONTROL OF BIOLOGICAL BASES**

Year, Semester: 1st year/2nd semester

Lecture: **2**

Requirements

Short course description:

Definition of quality in plant production. 3 dimensional expression of quality. Role of agroecological factors in plant producing processes, their effect on quality. Quality control system of biological genetic bases. Role of biological bases in making plant products. Connections between agrotechnics and quality. Interactive effects of production technology in the quality assurance process. Quality of cereals. Quality of legumes. Quality of oil plants. Quality of rooted and tuberous plants. Quality of industrial plants. Quality of forage plants.

Clean-bred animal breeding, system of variety registration, crossing methods, hybrids,

CHAPTER 10

organizations of animal breeding. Performance testing codes of sheep, pig, cattle, horse, poultry. Certification of different animal species, carriage testing systems, operative regulation of quality. Purebreeding, accreditation process of breeds, crossbreeding. Hybrids. Institutional structure of the livestock industry. Performance test codexes for sheep, pig, cattle, horse and poultry species. Registration of species. Livestock judging. Regulation of livestock qualification.

Required reading materials

Copeland and McDonald: Principles of Seed Science and Technology
4th. Springer, 2001.

Thomson: Seeds for the Future: The Impact of Genetically Modified Crops on the Environment
Cornell University Press, 2007.

Loewer: Seeds: The Definitive Guide to Growing, History, and Lore
Timber Press., 2005.

Bewley et al: The Encyclopedis of Seeds: Science, Technology and Uses
CABI, 2006.

McVicar: Seeds: The Ultimate Guide to Growing Successfully from Seed
The Lyons Press, 2003.

Basra: Handbook Of Seed Science And Technology
Food Products Press, 2006.

Black-Bewley: Seed Technology and Its Biological Basis
Blackwell Publishing Ltd., 2000.

McDonald: Seed Science And Technology Laboratory Manual
Iowa State University Press, 1989.

Matthews: Advances in Research and Technology of Seeds
Center agricultural Pub & Document, 1987.

Hunsley, Roger E., Beeson, Malcolm W.: Livestock judging, selection and evaluation
IPP. The Interstate Printers and Publishers, Inc., Danville,

Acker, Duane & Tour, Mickey La & Cunningham, Merl: Animal science and Industry
7th. Pearson Education, Limited, Harlow, UK., 2004.

Institute of Agricultural Chemistry and Soil Science

Subject: **BIOCHEMICAL BASES OF PRODUCTS' QUALITY**

Year, Semester: 1st year/2nd semester

Lecture: **2**

Requirements

Short course description:

Enzymes, hormones. Quality determining protein, carbohydrate, lipid and vitamin content. Intermediate metabolism of these molecules and influencing factors. Natural antioxidants and their role.

Required reading materials

Mathews-van Holde: Biochemistry

The Benjamin/Cummings Publishing Company, 2000.

Karla L. Roehrig: Carbohydrate biochemistry and metabolism

AVI Publishing, 1984.

Kent K. Stewart, John R. Whitaker: Modern Methods of Food Analysis

AVI Publishing Company, 1984.

Institute of Crop Sciences

Subject: **MEDICINAL PLANTS AND THEIR PROCESSING**

Year, Semester: 1st year/2nd semester

Lecture: **1**

Practical: **3**

Requirements

Short course description:

Historical review and importance of medicinal herbs growing in the World and Hungary. Different drugs from medicinal plants, active ingredients, botanical grouping, applications. Agroecological, biological-genetic, and agrotechnical factors in the crop management models of medicinal plants. The most important annual and perennial medicinal plants (general and specific crop management conditions and agrotechnical demands). The primary processing technologies of medicinal plants (drying, extraction methods etc). The quality of medicinal plants and its modifying ecological, genetic and agrotechnical factors. Biotechnology in medicinal crops. New future issues and challenges in medicinal crop production.

Required reading materials

Duke, James A. Boca Raton: Handbook of medicinal herbs

CRC Press, 2001.

Zohara Yaniv-Uriel Bachrach: Handbook of medicinal plants

The Haswort Medical Press., 2005.

Hydergruda and Hyderadad: Cultivation of medicinal and aromatic crops

Univ. Press., 2001.

Richard Alan Miller: Herb processing facility

Goodwood, Canada, Richter Herbs, 2002.

Halva, Seija and Lyle E. Craker: Manual for northern herb growers

HSMP Press, 1996.

Institute of Food Science

Subject: **DISSERTATION I.**

Year, Semester: 1st year/2nd semester

Practical: **5**

CHAPTER 10

Subject: **ETHICAL AND LEGAL ISSUES OF BIOTECHNOLOGY**

Year, Semester: 1st year/2nd semester

Lecture: **2**

Requirements

Short course description:

Genetic modification of crop plants. Effects, ethical, and legal issues.

The topics of this course to be discussed are: the structure of DNA, RNA and proteins. From DNA to proteins. The recombinant DNA technology. Horizontal gene transfer. The role of the transgene, of the promoter and marker gene. Present and future directions of recombinant GMO technology. The anti-sense DNA technology. The terminator technology. PCR. DNA chips. The effect of transformation on the genome. Substantial equivalence. Selection of the GM plants. The events. The risks assessment. The regulation of release of GMOs, laws, EU Directives. The possible environmental and health risks of GMOs. Ethical, social, ethnic and religious issues.

Required reading materials

Paul B. Thompson: Food Biotechnology in Ethical Perspective
Springer, 2007.

Martin Teitel-Martin Teitel Ph.D-Ralph Nader: Genetically Engineered Food: Changing the Nature of Nature

Park Street Press, 2001.

Jeoffry Smith: Seeds of deception

William Engdal: Seeds of disruption

Subject: **FOOD TOXICOLOGY**

Year, Semester: 1st year/2nd semester

Lecture: **3**

Requirements

Short course description:

This course meets the following Overarching Learning Goals for the Food Safety Certificate:

- 1) Effectively analyze, synthesize and evaluate food safety data.
- 2) Design and assess food safety assurance strategies, especially regarding their effectiveness within food-related industries.
- 3) Communicate professionally about food safety.

Required reading materials

Michael J. Derelanko-Mannfred A. Hollinger: CRC Handbook of Toxicology
1995.

Descotes J.: Human Toxicology
Elsevier, 1987.

Vernet J. P.: Heavy Metals in the Environment
Elsevier, 1991.

Frank Kotsonis and Maureen Mackey: Nutritional Toxicology
2nd.

Vettorazzi, G.: Handbook of international food regulatory toxicology. Food Additives.
Sp.Medical&Scientific Books, New York, 1981.
Principles for the Safety Assessment of Food Additives and Contaminates in Food Environmental Health Criteria
1987.

Subject: **MICROBIOLOGICAL ASPECTS OF FOOD QUALITY AND SAFETY**

Year, Semester: 1st year/2nd semester

Lecture: **2**

Practical: **2**

Requirements

Short course description:

Offering recent general and particular knowledge on chemical and biological components of food, main conservation processes, microorganisms as deteriorating agents and the caused illness, demands of Good Manufacturing Practice, and criteria of food-qualification.

Required reading materials

Doyle, M., Beuchat, L., Montville, T. J. Eds: Food Microbiology: Fundamentals and Frontiers
ASM Press, Washington, DC, 2001.

Adams M. R, Moss M. O. : Food Microbiology

RSC Publishing, Cambridge, 2008. ISBN: 9780854042845

Jay, J. M.-Loessner, M. J.-Golden, D. A.: Modern Food Microbiology

Springer Publish., 2005. ISBN: 0-387-23180-3

Subject: **MODERN METHODS OF ANALYSIS II. (SEPARATION TECHNIQUES)**

Year, Semester: 1st year/2nd semester

Lecture: **1**

Practical: **4**

Requirements

Short course description:

Traditional and modern analytical methods are discussed in the respect of practical execution. Practical knowledge is provided in fluid-fluid and solid-fluid extraction as a part of clean-up processes. The course provides understanding in thin-layer-, column- gas- and liquid chromatography, and their role in food analysis. The acquired theoretical knowledge is enforced in laboratory practice.

Required reading materials

Thomas Beesley, Benjamin Buglio: Quantitative Chromatographic Analysis

Marcel Dekker, 2004. ISBN: 0-8247-0503-3

Manz, A.-Pamme, N.-Iosifidis, D.: Bioanalytical Chemistry

Imperial College Press, London, 2004.

Wells, D. A.: High Throughput Bioanalytical Sample Preparation

Elsevier Oxford, 2003.

CHAPTER 10

Skoog D. A., D. M. West, F. J. Holler: Fundamentals of analytical Chemistry
1992.

Subject: **QUALITY AND SAFETY OF FOOD TECHNOLOGIES**

Year, Semester: 1st year/2nd semester

Lecture: **2**

Practical: **2**

Requirements

Factors determining the production of safety food . Requirements and regulations regarding safety of plant originated raw materials of food. Quality assurance systems in plant production: HACCP, GAP, ISO.

Food safety regulations in grain processing (mill, hulling mill, extruder), baking and oil producing industry, in fruit and vegetable production.

Requirements and regulations regarding safety of animal originated raw materials of food.

Feed production, meat- and poultry processing, milk and preserving industry. Safety problems of storage and transport. Public supply and catering.

Required reading materials

R. E. Hester & R. M. Harrison (Editor): Food Safety and Food Quality

ISBN: 978-0-85404-270-8

H. Lelieveld, I T Moster, B White and J Holah: Hygiene in food processing: Principles and practice

S. E. Mortimore, C. A. Wallace, C. A. Cassianos: HACCP

ISBN: 0632056487

Subject: **QUALITY ASSURANCE OF MEASUREMENT**

Year, Semester: 1st year/2nd semester

Lecture: **2**

Requirements

Short course description:

This course provides general principles of the quality assurance in the chemical analytical measurements. Increasing laboratory data quality and meeting user needs are present and futuristic goals. Quality assurance of measurements is a key factor for technical and business success. Providers and users of laboratory data need to be concerned about quality assurance. Proper application of quality assurance principles can help solve or prevent problems.

The course content includes: glossary/acronyms, benefits/costs of quality assurance, basics of quality assurance, staff training, auditing, sampling, archives, holding times, preservatives, instrument performance, calibration, blanks, matrix spike, compound identification, interferences, system performance, reporting data, basic statistics, control charting, standard methods, how to establish a quality assurance program, Good Laboratory Practices (GLP), and Good Automated Laboratory Practices (GALP). quality assurance guidelines.

Required reading materials

ILAC-G13:2000: Guidelines for the Requirements for the Competence of Providers of Proficiency Testing Schemes

ISO/IEC Guide 43-2:1997, Proficiency testing by interlaboratory comparisons-Part 2: selection and use of proficiency testing schemes by laboratory accreditation bodies

ASTM E1301-95 Standard Guide for Proficiency Testing by Interlaboratory Comparisons

ISO 5725-1:1994, Accuracy (trueness and precision of measurement methods and results-Part 1: general principles and definitions.)

ISO 5725-1:1994, Accuracy (trueness and precision of measurement methods and results-Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method.)

ISO 5725-1:1994, Accuracy (trueness and precision of measurement methods and results-Part 4: Basic methods for the determination of the trueness of a standard measurement method.)

ISO Guide to expression of uncertainty of measurement
1995.

ISO 13528 (Draft) statistical methods for use in proficiency testing by interlaboratory comparison
1998.

Institute of Water and Environmental Management

Subject: **ENVIRONMENTAL ASPECTS OF FOOD PROCESSING**

Year, Semester: 1st year/2nd semester

Lecture: **3**

Requirements

Short course description:

Environmental status of Hungary. History of environmental management and protection. Types of natural resources, renewable, fossil natural resources. Air pollution and prevention against air pollution. Soil pollution and degradation; Soil contamination and pollution sources. Erosion, Water pollution and water quality treatment, water quality. Administration of water management. Environmental aspects of cropping. Environmental aspects of animal husbandry. Environmental impact assessment. Environmental aspects of food processing and producing. Cleaner technologies. Life cycle assessment. Environmental indicators. Best Available Technology (BAT).

Required reading materials

Pierzynsky, G. M.: Soil and Environmental quality
2nd. CRC Press., 2000.

Chen, F. W.: The Civil Engineering Handbook
CRC Press., 2000.

Nazaroff, W. W.: Environmental Engineering Science
John Wiley&Sons, 2001.

Agricultural Laboratory Centre

Subject: **INNOVATION MANAGEMENT**

Year, Semester: 2nd year/1st semester

Lecture: **2**

Requirements

Short course description: Determination of innovation, the elements of innovation chain. Type of innovational organizations: establishment of spin-off and start-up enterprise. Personal, and technical conditions of the innovation flow. Realization part of innovation, ongoing development and controlling system. Efficiency of the innovation, measurement of the innovation's profitability. Innovation agencies, general support for innovative actions.

Required reading materials

Joe Tidd, John Bessant, Keith Pavitt: Managing Innovation: Integrating Technological, Market and Organizational Change

3rd. John Wiley&Sons, 2005. ISBN: 0470093269

Michael Baker, Susan Hart: Product Strategy and Management

2nd. Financial Times/Prentice hall, 2007. ISBN: 0273694502

Subject: **QUALITY CONTROL, QUALITY MANAGEMENT**

Year, Semester: 2nd year/1st semester

Lecture: **3**

Requirements

Short course description:

Process approach, systems approach, control theory. Interpretation of quality and quality control system. National quality regulation system. Company quality management systems. Process control, conformity control and quality control of production processes. Customer relationship management. Supplier relationship management. Product desing and production process development, quality capability of production system. Standardized and non-standardized quality management systems.

Required reading materials

Evans J. R. -Lindsay W. M.: The management and Control of Quality.
West Publishing, 1993.

David L. Goetsch-Stanley B. Davis: Quality Management
5th.

James R. Evans-William M. Lindsay: Managing for Quality and Performance Excellence
2004.

Department of Animal Nutrition and Food Biotechnology

Subject: **FOOD SAFETY ASSESSMENT OF AGROCHEMICALS**

Year, Semester: 2nd year/1st semester

Lecture: **2**

Requirements

Short course description:

Overview of principles of risk analysis, classification of agrochemicals in relation to food safety. Significance of impurities of technical grade pesticide products. Metabolism of pesticides. Farm animal feeding studies. Sampling, analysis of pesticide residues. Major sources of uncertainty of residue analytical results. Supervised field trials. Distribution of pesticide residues on treated objects. Principles of exposure of consumers to pesticide residues. Principles of estimation of maximum residue limits (MRLs) for pesticide residues

Required reading materials

Fernandez Alba A. R. (ed.): Chromatographic Mass Spectrometric Food Analysis for Trace determination of Pesticide Residues

Comprehensive Analytical Chemistry, 2005.

Tadeo J. L. (ed.): Analysis of Pesticides in Food and Environmental Samples

CRC Press., 2008.

Hamilton D. J. and Crossley S. (eds.): Pesticide Residues in Food and Drinking Water: Human Exposure and Risks

John Wiley&Sons, 2003.

Roberts T. R.: Metabolic Pathways of Agrochemicals

The Royal Society of Chemistry,

Fajgelj A. and Ambrus A. (eds.): Principles of Method Validation

The Royal Society of Chemistry. Cambridge, 2000.

Miller J. N. and Miller J. C.: Statistics and Chemometrics for Analytical Chemistry

Pearson Education, Limited, Harlow, UK., 2000.

Institute of Food Science

Subject: **ANALYTICAL AND MICROBIOLOGICAL RAPID METHODS**

Year, Semester: 2nd year/1st semester

Lecture: **1**

Practical: **3**

Requirements

Short course description:

Transfer of basic knowledge of analytical chemistry, necessary for successful learning of other basic and professional subjects of the educational system. It is an aim of the teaching of the subject that the students gain knowledge of both classic analytical and modern instrumental analytical chemistry and microbiological methods, and after completion of this subject to establish such a level of analytical knowledge of the students, which makes them capable of rapid determination of

CHAPTER 10

composition of agricultural products and foodstuffs, and understanding of the analytical results.

Required reading materials

Doyle, M., Beuchat, L., Montville, T. J. Eds: Food Microbiology: Fundamentals and Frontiers
ASM Press, Washington, DC, 2001.

W. Baltes: Rapid methods for analysis of food and food raw material
Behr's Verlag Hamburg, 1990.

H. A. Flaschka-A.J. Barnard-P. E. Sturrock: Quantitative analytical chemistry
Willard Garnt Press, 1980.

Subject: **DISSERTATION II.**

Year, Semester: 2nd year/1st semester

Practical: 4

Subject: **FOOD QUALITY AND SAFETY RISK ANALYSIS**

Year, Semester: 2nd year/1st semester

Lecture: 2

Practical: 1

Requirements

Short course description:

Concept of hazard and risk. System of risk analysis. Risk assessment, risk management and risk communication. Methods of risk assessment. Different approaches of assessment of microbiological and chemical risks. System of microbiological risk assessment. Hazard identification and hazard characterization. Exposure assessment; assessment of microbiological exposure. Tools of microbiological risk assessment: predictive microbiological models. Data basis and softwares of modelling. Identification of chemical hazards. Methods of assessing hazards. Cross contamination, allergens and biomarkers. Risk management and risk management strategies, concepts. Food safety pyramid. Risk communication, consumer science. Risk perception. Legislation of scientific, regional and international organizations taking part in risk assessment. Microbiological and toxicological limits. Case studies.

Required reading materials

EFSA: Opinions of Scientific Panels and Units

Jim E. Riviere: Chemical food safety: A Scientist's Perspective
BTS, Newsletter, 2004.

David R. Tennant: Food Chemical Risk Analysis
Springer, 1997.

Subject: **HYPHENATED ANALYTICAL METHODS**

Year, Semester: 2nd year/1st semester

Lecture: **1**

Practical: **1**

Requirements

Short course description:

Separation and detection methods, moreover advantages and disadvantages of attached analytical systems for speciation of different elements (As, Se, Hg, Cr, Sn, Sb). Separation and detection methods for analysis of various organic components. Sampling and sample preparation methods for speciation analyses. Introduction and detection methods of arsenic, selenium, mercury, tin, lead and other species. Laboratory practice in the above fields.

Required reading materials

Belitz D., Grosch W., Schieberle P.: Food Chemistry
Springer Publish., 2004.

Boss, C. B. & Freedman, K. J.: Concepts, instrumentation, and techniques in inductively coupled plasma optical emission spectrometry
Perkin Elmer. USA., 1997.

Les Ebdon, Les Pitts, Rita Cornelis, helen crews, Olivier F.X. Donard, philippe quevauviller: Trace element speciation for environment, food, health.

The Royal society of Chemistry. MPG Books Ltd., Bodmin, Cornwall, UK., 2001.

Montaser, A. & Golightly, D. W.: Inductively coupled plasmas in analytical atomic spectrometry
VCH Publishers. New York., 1987.

Montaser, A. : Inductively coupled plasmas mass spectrometry
VCH Publishers, New York, 1998.

Subject: **QUALITY MANAGEMENT SYSTEMS**

Year, Semester: 2nd year/1st semester

Lecture: **3**

Requirements

Short course description:

ISO 9000 standard series. Characteristics of ISO 9004 standard. Quality management system.

Management responsibility. Resource management. Product realization. Measurement, analysis and improvement. Quality control loop.

Model of Good Manufacturing Practice.

Characteristics of quality management systems. Total quality management.

Measurement of excellence, European Quality Award.

Required reading materials

ISO 9004:2009-Managing for the sustained success of an organization- A quality management approach

Howard S. Gitlow: Quality Management Systems: A Practical Guide, Models for company quality management systems 2007.

Subject: **RHEOLOGY IN FOOD TESTING**

Year, Semester: 2nd year/1st semester

Lecture: **1**

Practical: **1**

Requirements

Short course description:

Disciple of rheological testing, and their physical-mechanical basics (hydrodynamics, fluid models). Role of rheological testing in the international product qualification and analysis. Rheologic methods in the pasta, baking, milk and purée industries. Application of rheologic tests in other fields.

Examinations in practice: dough testing by Farinograph, Alveograph and Extensograph. Texture analysis by TA.XT plus, RVA Analyser on different raw materials and products.

Required reading materials

Approved Methods American Association of Cereal Chemists

Bert L. D'Appolonia-Wallace H. Kunerth: The farinograph handbook

AACC USA,

Hamed Faridi-Vladimir F. Rasper: The Alveograph Handbook

AACC USA,

James F. Steffe: Rheological methods in food process engineering

Freeman Press., 1996.

Official Methods of Analysis of AOAC International

Vladimir F. Raspor-Ken R. Preston: The Extensigraph Handbook.

AACC. USA,

Agricultural Laboratory Centre

Subject: **FOOD INDUSTRY MANAGEMENT AND ECONOMICS**

Year, Semester: 2nd year/2nd semester

Lecture: **2**

Practical: **2**

Requirements

Short course description:

The students have to familiarize with the system of processing, storage and conservation of agricultural products in the given economic environment. Organisation and public administration of the food industry and the selected sub-branch. Presentation of some important food-chains from several sub-branches. The privatisation of food industry and its effects on Hungarian agribusiness. The key issues of EU joining. The situation, regulation and competitiveness of the EU food industry. The connections of market regulation and the subsidy system. The basis of food-industry marketing.

Required reading materials

W. Smith Greig: Economics and Management of Food Processing
Westport AVI, 1984.

Chester O. McCorkle (Ed.): Economics of Food Processing in the USA
1988.

Wierenga B. Grunert K, Steenkamp JBEM, Wedel M, van Tilbur: Agricultural marketing and Consumer Behaviour in a Changing World.

Kluwer Academic Press, ISBN: 978-079239-856-1

W. Bruce Trail and Eamonn Pitts: Competitiveness in the food industry
Blackie Academic-Professional,

W. B. Trail-K.G. Grunert: Product and process Innovation in the Food Industry

Blackie Academic&Professional. London., 1997. ISBN: 0751404241

M. D. Ranken R. C. Kill, C. G. J. Baker: Food Industries Manual.

Subject: **LOGISTICS IN FOOD CHAIN**

Year, Semester: 2nd year/2nd semester

Lecture: **2**

Requirements

Short course description:

The concept and the significance of logistics, the rules of product- and stock-register. Logistic equipments used in food production, profession-specific techniques, logistical system design. Packaging, distributing fundamentals, quality assurance systems of purchasing and supply chain.

Required reading materials

Donald Bowersox, David Closs, M. Bixby Cooper: Supply Chain Logistics Management
ISBN: 0-07-235100-4

Robert M. Monczka, Robert J. Trent, Robert B. Handfield: Purchasing and Supply Chain
ISBN: 0-324-02315-4

Luning, P. A.-Devlieghere, F.-Verhé, R.: Safety in the agri-food chain
Wageningen Academic Publishers, 2007.

Institute of Food Science

Subject: **DISSERTATION III.**

Year, Semester: 2nd year/2nd semester

Practical: **6**

CHAPTER 10

Subject: **QUALITY SYSTEM AUDIT**

Year, Semester: 2nd year/2nd semester

Lecture: **2**

Practical: **1**

Requirements

Short course description:

Audit program: objectives and extend; responsibilities, resources and procedures; implementation; records; monitoring and reviewing.

Initiating the audit; conducting document review; on-site audit activities; managing the audit report; completing the audit; conducting an audit follow-up.

Competence and evaluation of auditors.

Required reading materials

ISO 19011:2011-Guidelines for auditing management systems

ISO 9001:2008 Quality management systems

Mike Dillon-Chris Griffith: Auditing in the food industry

2001. ISBN: 9780849312144

Subject: **TRACEABILITY IN THE FOOD CHAIN**

Year, Semester: 2nd year/2nd semester

Lecture: **2**

Practical: **1**

Requirements

Short course description:

Definition of traceability. Uniform attitude of the food chain: from field to the consumer's table. System of traceability in case of food of plant and animal origin. Traceability of prepacked food and food/feed in bulk. Legal system of traceability. Consequences of the 178/2002 EU regulation issued of the EP and EC. The ENAR system for living animals. Tracing and tracking techniques in practice: EAN code, RFID identification, DNA identification of GMOs.

Required reading materials

Biacs, P.-Solymosi, V.: Traceability in focus-Hungarian Agricultural Research
2007.

Smith-Furness: Improving traceability in food processing and distribution

Woodhead Publishing Limited, 2006. ISBN: 1855739593

CIES: Implementing traceability in the food supply chain

CIES, Paris, 2005.