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
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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, Hajdúbőszörmény 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
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.
DEAN'S WELCOME

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
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.
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, Bőszörményi út 138.
Phone: +36-52/508-412; 88438
Fax: +36-52/486-292
E-mail: komlosi@agr.unideb.hu

Vice Dean for Educational Affairs: Dr. habil. Csaba Juhász
Address: 4032 Debrecen, Bőszörményi út 138.
Phone: +36-52/508-454 88454
Fax: +36-52/508-454 88454
E-mail: juhasz@agr.unideb.hu

Vice Dean of Scientific Affairs: Dr. László Stündl
Address: 4032 Debrecen, Bőszörményi út 138.
Phone: +36-52/508-444 88226
Fax: +36-52/486-292
E-mail: stundl@agr.unideb.hu

DEAN’S OFFICE

Head of Dean’s Office: Dr. Mrs. Julianna Fricz Mocsári
Address: 4032 Debrecen, Bőszörményi 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, Bőszörményi 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
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.

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 Prokitsch Ph.D.
László Stündl Ph.D.
CHAPTER 6

Assistant Lecturer
Ms. Nóra Pálfyné Vass Ph.D.

Assistant Professor
Péter Bársimony 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 Jávor C.Sc.

Professor
András Kovács D.Sc.

Assistant Lecturer
Ms. Zsófia Rózsáné Várszegi Ph.D.

Senior Research Fellow
Ms. Szilvia Kusza Ph.D.
THE DEPARTMENTS OF THE FACULTY

INSTITUTE OF FOOD SCIENCE
Bőszörményi út 138., Debrecen, 4032

Full Professor, Head of Institute  Béla Kovács Ph.D.
Professor  János Csapó D.Sc.
Technical Assistant  Ms. Éva Bacskainé Bódi
Associate Professor  Ms. Andrea Tóthné Bogárdi
Assistant Lecturer  Ms. Éva Bacskainé Bódi
Assistant Professor  Ms. Erzsébet Karaffa Ph.D.
Secretary  Ms. Tünde Simon

INSTITUTE FOR LAND UTILISATION, TECHNOLOGY AND REGIONAL DEVELOPMENT
Bőszörményi út 138., Debrecen, 4032

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

INSTITUTE OF HORTICULTURE
Bőszörményi út 138., Debrecen, 4032

Head of Institute  Imre Holb D.Sc.
Assistant Research Fellow  Ferenc Abonyi
Associate Professor  Ms. Mária Takácsné Hájos C.Sc.
INSTITUTE OF CROP SCIENCES
Böszörményi út 138., Debrecen, 4032

Head of the Institute
Péter Pepó D.Sc.

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.
THE DEPARTMENTS OF THE FACULTY

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 Kővics 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 Őri
Technical Assistant Ms. Nóra Bessenyei Tarpay
Csaba Kiss
Ms. Hajnalka Pákozdy
Ms. Istvánné Sőrés
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 Bökfi
Associate Professor Ms. Elza Kovács Ph.D.
Assistant Lecturer Ms. Tünde Fórián Ph.D.
### FACULTY OF ECONOMICS AND BUSINESS
Bőszörményi út 138., Debrecen, 4032

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
</tr>
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<tbody>
<tr>
<td>Assistant Professor</td>
<td>Attila Nagy Ph.D.</td>
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<td></td>
<td>Csaba Pregun Ph.D.</td>
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<td>Secretary</td>
<td>Imre Lászlóné Huszka</td>
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<td>Zsuzsanna Szathmárinné Pongor</td>
</tr>
<tr>
<td>Assistant Research Fellow</td>
<td>Zoltán Győri Ph.D.</td>
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<tr>
<td>Professor</td>
<td>Csaba Berde C.Sc.</td>
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<td>Miklós Herdon Ph.D.</td>
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<td></td>
<td>András Nábrádi MBA, C.Sc.</td>
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<td>Géza Nagy C.Sc.</td>
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<td>József Popp D.Sc.</td>
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<td></td>
<td>Zoltán Szakály C.Sc.</td>
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<tr>
<td>College Professor</td>
<td>Ferenc Kalmár Ph.D.</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>Edit Gizella Szűcs Ph.D.</td>
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<td></td>
<td>Péter Balogh Ph.D.</td>
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<td>Zsolt Csapó Ph.D.</td>
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<td></td>
<td>Wiwczaroski Dr. Troy B. Ph.D.</td>
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<td>János Felföldi Ph.D.</td>
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<td>István Grigorszky Ph.D.</td>
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<td>Csilla Juhász Ph.D.</td>
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<tr>
<td></td>
<td>István Kuti C.Sc.</td>
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<td>László Lakatos Ph.D.</td>
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<tr>
<td></td>
<td>Ilona Nagyné Polyák Ph.D.</td>
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<td>Miklós Pakurár Ph.D.</td>
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<td>Károly Pető C.Sc.</td>
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<td>László Posta C.Sc.</td>
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<td>Sándor Szűcs C.Sc.</td>
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<td>István Szűcs Ph.D.</td>
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<tr>
<td>Assistant Lecturer</td>
<td>Mónika Harangi-Rákos</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>Andrea Bauerné Gáthy Ph.D.</td>
</tr>
</tbody>
</table>
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.

Research Fellow

Ferenc Buzás Ph.D.
# UNIVERSITY CALENDAR

### Academic calendar 2015/2016

<table>
<thead>
<tr>
<th>Events</th>
<th>Dates</th>
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</thead>
<tbody>
<tr>
<td>Opening Ceremony</td>
<td>September 6 (Sunday)</td>
</tr>
<tr>
<td>Enrolment week</td>
<td>September 7 - 11</td>
</tr>
<tr>
<td>Study period for not final year students</td>
<td>September 14 - December 18 (14 weeks)</td>
</tr>
<tr>
<td>Study period for final year students</td>
<td>September 14 - November 13 (9 weeks)</td>
</tr>
<tr>
<td>Deadline for thesis submission</td>
<td>October 30</td>
</tr>
<tr>
<td>Examination period for final year students</td>
<td>November 16 - December 4 (3 weeks)</td>
</tr>
<tr>
<td>Examination period for not final year students</td>
<td>December 21 – February 5 (7 weeks)</td>
</tr>
<tr>
<td>Defending of the thesis</td>
<td>November 30 – December 1</td>
</tr>
<tr>
<td>Final exam</td>
<td>December 10 - 11</td>
</tr>
<tr>
<td>Graduation ceremony</td>
<td>December 19</td>
</tr>
<tr>
<td>Enrolment week</td>
<td>February 8 - 12</td>
</tr>
<tr>
<td>Study period for not final year students</td>
<td>February 15 – May 20 (14 weeks)</td>
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<tr>
<td>Study period for final year students</td>
<td>February 15 - April 22 (10 weeks)</td>
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<tr>
<td>Deadline of the thesis</td>
<td>April 22</td>
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<tr>
<td>Examination period for final year students</td>
<td>April 25 – May 20 (4 weeks)</td>
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<tr>
<td>Examination period for not final year students</td>
<td>May 23 - July 8 (7 weeks)</td>
</tr>
<tr>
<td>Defending of the thesis</td>
<td>May 26 - 27</td>
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<tr>
<td>Final exam</td>
<td>June 6 - 7</td>
</tr>
<tr>
<td>Graduation ceremony</td>
<td>June 18</td>
</tr>
</tbody>
</table>
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.
## CURRICULUM OF THE FULL TIME PROGRAMME

<table>
<thead>
<tr>
<th>Compulsory courses</th>
<th>1st semester</th>
<th>2nd semester</th>
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<tbody>
<tr>
<td>Neptun code</td>
<td>MTMEE032</td>
<td>MTMEE036</td>
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<td>MTMEE011</td>
<td>MTMEE012</td>
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<tr>
<td>Subjects</td>
<td>Biochemical bases of products quality</td>
<td>Environmental aspects of food processing</td>
</tr>
<tr>
<td></td>
<td>Ethical and legal issues of biotechnology</td>
<td>Expectations to foodstuffs, consumer protection</td>
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<tr>
<td></td>
<td>Food toxicology</td>
<td>Marketing, accounting and finance</td>
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<td></td>
<td>Medicinal plants and their processing</td>
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<tr>
<td>Subjects</td>
<td>Dissertation</td>
<td>ESE</td>
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<tr>
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<td>2</td>
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<td>L S P Exam</td>
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<td>2</td>
<td>5</td>
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<td>Prerequisites of taking the subject</td>
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<td>MTMEE005</td>
<td>MTMEE013</td>
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<tr>
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<td>1 year</td>
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<td>3</td>
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<tr>
<td>Neptun code</td>
<td>1st year, 1st Semester</td>
<td>2nd year, 1st Semester</td>
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<tr>
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<tr>
<td>MTMEE008</td>
<td>Microbiological aspects of food quality and safety</td>
<td>Modern methods of analysis I. (Spectroscopy)</td>
</tr>
<tr>
<td>MTMEE002</td>
<td>1</td>
<td>4</td>
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<td>MTMEE007</td>
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<td>MTMEE009</td>
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<td>MTMEE014</td>
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## Compulsory courses

### 1. year (continued)

<table>
<thead>
<tr>
<th>Subjects</th>
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<tr>
<td>Quality control of biological bases</td>
<td>MTMEE031</td>
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<td>ESE 3</td>
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<tr>
<td>Regulation of food production, quality and safety</td>
<td>MTMEE004</td>
<td>2</td>
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<td>Theory of measuring and experimental designs</td>
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<tr>
<td>MTMEE028</td>
<td></td>
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</table>

**Subjects**

- Analytical and microbiological rapid methods
- Dissertation II
- Dissertation III
- Food industry management and economics
- Food quality and safety risk analysis
- Food safety assessment of agrochemicals
- Hyphenated analytical methods
- Management Innovation
- Logistics in food chain

**Prerequisites of taking the subject**

- None
- None
- None
- None
- None
- None
- None
- None
- None
- None
### Compulsory courses

#### 2. year (continued)

<table>
<thead>
<tr>
<th>Subjects</th>
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<th>1&lt;sup&gt;st&lt;/sup&gt; semester</th>
<th>2&lt;sup&gt;nd&lt;/sup&gt; semester</th>
<th>Prerequisites of taking the subject</th>
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<tbody>
<tr>
<td>Quality control, quality management</td>
<td>MTMEE016</td>
<td>3 L S P ESE 3</td>
<td></td>
<td>None</td>
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<tr>
<td>Quality management systems</td>
<td>MTMEE020</td>
<td>3 L S ESE 4</td>
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<td>Quality system audit</td>
<td>MTMEE024</td>
<td></td>
<td>2 L S 1 ESE 3</td>
<td>None</td>
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<tr>
<td>Rheology in food testing</td>
<td>MTMEE021</td>
<td>1 L S 1 AW5 2</td>
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<tr>
<td>Traceability in the food chain</td>
<td>MTMEE022</td>
<td></td>
<td>2 L S 1 ESE 2</td>
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<td>Subjects</td>
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<td>2nd semester</td>
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<td>Comparative human and animal nutrition</td>
<td>MTMEE030</td>
<td>L 3</td>
<td>L 2</td>
<td>None</td>
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<td>Extension knowledge</td>
<td>MTMEE028</td>
<td>S 3</td>
<td>S 2</td>
<td>ESE 1</td>
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<td>Healthy Nutrition</td>
<td>MTMEE027</td>
<td>P 1</td>
<td>P 2</td>
<td>ESE 1</td>
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<tr>
<td>Meat and Milk Processing</td>
<td>MTMAE033-K3</td>
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<tr>
<td>Nutrition Therapy</td>
<td>MTMAE034-K2</td>
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### Required elective courses

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<th>Subject</th>
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<th>1&lt;sup&gt;st&lt;/sup&gt; semester</th>
<th>2&lt;sup&gt;nd&lt;/sup&gt; semester</th>
<th>Prerequisites of taking the subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biosensors in food analysis</td>
<td>MTMEE033</td>
<td>L 1 S</td>
<td>ESE 2</td>
<td>None</td>
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<tr>
<td>Quality evaluation of food proteins</td>
<td>MTMEE035</td>
<td></td>
<td>2 ESE 2</td>
<td>None</td>
</tr>
</tbody>
</table>
Agricultural Laboratory Centre

Subject: **REGULATION OF FOOD PRODUCTION, QUALITY AND SAFETY**
Year, Semester: 1\textsuperscript{st} year/1\textsuperscript{st} 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**

*Codex Alimentarius Hungaricus*
*IFS/BRC/EFSIS standards*

Genetics Group

Subject: **MOLECULAR BIOLOGY**
Year, Semester: 1\textsuperscript{st} year/1\textsuperscript{st} semester
Lecture: 2
Practical: 2

**Requirements**

Short course description:
Theory:
Practice:
Morphological studies on chromosomes, karyotype, karyogram, mitosis, meiosis, application of molecular biological methods in own research. Electrophoresis, separation techniques.
CHAPTER 10

Required reading materials

Bernard R. Glick and Jack J. Pasternak: Molecular biotechnology: principles and applications of recombinant DNA
Bruce Alberts et al: Molecular biology of the cell
Frederick M. Ausubel et al: Current protocols in molecular biology

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, vitamines, minerals and other food sources; digestion; factors influencing bioavailability; absorption; transport; tissue uptake and distribution; food additives, the effects of foods from genetic modification, traditional and organic production.

Required reading materials

Shils et al.: Modern Nutrition in Health and Disease
Berg J., Tymoczko JL, Stryer L: Biochemistry

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

Subject: MODERN METHODS OF ANALYSIS I. (SPECTROSCOPY)
Year, Semester: 1st year/1st semester
Lecture: 1
Practical: 4

Requirements

Short course description:


Required reading materials

Belitz D., Grosch W., Schieberle P.: Food Chemistry
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
Montaser, A.&Golightly, D. W.: Inductively coupled plasmas in analytical atomic spectometry
Montaser, A. : Inductively coupled plasmas mass spectometry
CHAPTER 10

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

- G. L. Robertson: *Food packaging and shelf life*
  Taylor & Francis Ltd., ISBN: 9781420078442
- J. M. Vergnaud-I. D. Rosca: *Assessing Food Safety of Polymer Packaging*
  Smithers Rapra Technology, 2006.

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

Required reading materials

Philip Kotler-Gary Armstrong: Principles of Marketing
Bauer András-Berács József: Marketing

Department of Landscape Ecology

Subject: QUALITY CONTROL OF BIOLOGICAL BASES
Year, Semester: 1st year/2nd semester
Lecture: 2

Requirements
Short course description:
Clean-bred animal breeding, system of variety registration, crossing methods, hybrids,
CHAPTER 10

Required reading materials

Copeland and McDonald: Principles of Seed Science and Technology
CABI, 2006.
McVicar: Seeds: The Ultimate Guide to Growing Successfully from Seed
Basra: Handbook Of Seed Science And Technology
Food Products Press, 2006.
Black-Bewley: Seed Technology and Its Biological Basis
McDonald: Seed Science And Technology Laboratory Manual
Matthews: Advances in Research and Technology of Seeds
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

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
Karla L. Roehrig: Carbohydrate biochemistry and metabolism
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 primer processing technologies of medicinal plants (drying, extraction methods etc). The quality of medicinal plants and its modifying ecological, genetical 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
Zohara Yaniv-Uriel Bachrach: Handbook of medicinal plants
Hydergruda and Hyderadad: Cultivation of medicinal and aromatic crops
Richard Alan Miller: Herb processing facility
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
Martin Teitel-Martin Teitel Ph.D-Ralph Nader: Genetically Engineered Food: Changing the Nature of Nature
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
Vernet J. P.: Heavy Metals in the Environment
Frank Kotsonis and Maureen Mackey: Nutritional Toxicology
2nd.
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  
Adams M. R, Moss M. O. : Food Microbiology  

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  
Manz, A.-Pamme, N.-Iosifidis, D.: Bioanalytical Chemisiry  
Wells, D. A.: High Throughput Bioanalitical Sample Preparation  
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.
Institute of Water and Environmental Management

Subject: ENVIRONMENTAL ASPECTS OF FOOD PROCESSSING
Year, Semester: 1st year/2nd semester
Lecture: 3

Requirements

Short course description:


Required reading materials

Pierzynsky, G. M.: Soil and Environmental quality
Chen, F. W.: The Civil Engineering Handbook
Nazaroff, W. W.: Environmental Engineering Science
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 profitabilty. Innovation agencies, general support for innovative actions.

Required reading materials

Joe Tidd, John Bessant, Keith Pavitt: Managing Innovation: Integrating Technological, Market and Organizational Change
Michael Baker, Susan Hart: Product Strategy and Management

Subject: QUALITY CONTROL, QUALITY MANAGEMENT
Year, Semester: 2nd year/1st semester
Lecture: 3

Requirements

Short course description:

Required reading materials

Evans J. R. -Lindsay W. M.: The management and Control of Quality.
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:

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
Hamilton D. J. and Crossley S. (eds.): Pesticide Residues in Food and Drinking Water: Human Exposure and Risks
Roberts T. R.: Methabolic Pathways of Agrochemicals
The Royal Society of Chemistry,
Fajgelj A. and Ambrus A. (eds.): Principles of Method Validation
Miller J. N. and Miller J. C.: Statistics and Chemometrics for Analytical Chemistry

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

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:

Required reading materials

EFSA: Opinions of Scientific Panels and Units
Jim E. Riviere: Chemical food safety: A Scientist's Perspective
David R. Tennant: Food Chemical Risk Analysis
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

Boss, C. B.&Freeden, K. J.: Concepts, instrumentation, and techniques in inductively coupled plasma optical emission spectometry

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

Montaser, A.&Golightly, D. W.: Inductively coupled plasmas in analytical atomic spectometry

Montaser, A. : Inductively coupled plasmas mass spectometry

Subject: QUALITY MANAGEMENT SYSTEMS
Year, Semester: 2nd year/1st semester
Lecture: 3

Requirements

Short course description:


Required reading materials

ISO 9004:2009-Managing for the sustained success of an organization- A quality management approach
CHAPTER 10

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

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*

**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-Guidlines for auditing management systems
ISO 9001:2008 Quality management systems
Mike Dillon-Chris Griffith: Auditing in the food industry

Subject: TRACEABILITY IN THE FOOD CHAIN
Year, Semester: 2nd year/2nd semester
Lecture: 2
Practical: 1

Requirements

Short course description:

Required reading materials

Biacs, P.-Solymosi, V.: Traceability in focus-Hungarian Agricultural Research
2007.
Smith-Furness: Improving traceability in food processing and distribution
CIES: Implementing traceability in the food supply chain