

## **REQUIREMENTS**

### **2018-2019 academic year, 1st semester**

**Name and code of the subject:** Experimental design, MTBE7041A

**Name and title of the person responsible for the subject:** Dr. Endre Máthé, associate professor PhD

**Additional instructors involved in teaching the subject:** -

**Name and level of the program:** Food safety and quality engineering MSc

**Subject type:** optional

**Teaching timetable of the subject, type of examination:** 2 lect. + 2 pract., oral

**Credit value of the subject:** 3

#### **Purpose of teaching the subject:**

The basis of successful food development is the correctly applied experimental design, which is based on the “STEM” (Science-Technology-Engineering-Mathematics)-specific professional education and values. The logical system of “STEM” type research is reviewed, emphasizing the coherence between questioning and the experimental model, and the importance of evaluating the implementation of experiments. The peculiarities of “STEM” type verbal and nonverbal communication are being presented.

#### **Content of the subject (14 weeks):**

##### **LECTURES:**

- 1-2. The STEM- specific professional culture and values.
- 3-4. Research planning and implementation: choosing the right object to study, sample size allocation and the statistical methods, documentation of observations and hypothesis analysis.
- 5-6. The STEM type of observation and research logics. The direct and indirect proofs type of research data.
- 7-8. Data collecting and interpreting. Analysis of research data: descriptive statistics and correlation analysis; publication of numerical data.
- 9-11. Research publications types and their content, scientific writing style and ethical considerations.
- 12-14. Trends of food development. The role of preventive and therapeutic nutrition in food development.

##### **PRACTICALS:**

- 1-2. STEM specific informatics databases
- 3-4. Elaboration of research plans for food prototype development based on technological considerations and personalized nutrition.
- 5-8. Preparation and discussion of scientific presentations and publications based on theoretical considerations.
- 9-11. Visiting the main research and food development facilities of the faculty.
- 12-14. Discussions on the topics of the final research project.

**Type of mid-term examination:** participation in the practicals is mandatory. Attendance at 70% of the practicals is mandatory. In case of absence, a report must be submitted by the student within two weeks from the missed practice (theoretical and practical description).

Participation in the practicals is a precondition for the final exam.

**Method of assessment (semester examination mark - report, practical grade, colloquium, examination):** practical grade

**Teaching aids:** lecture specific PPTs, research/review papers

**Recommended literature:**

- Adams, D.S. (2003). Lab Math. A handbook of measurements, calculations and other quantitative skills for use at bench. Cold Spring Laboratory Press. Cold Spring Harbour, New York. ISBN 0-87969-634-6.
- Davis, M. (1996). Scientific papers and presentations. Academic Press. San Diego, London. ISBN: 0-12-206370-8.
- Lazic, Z. (2004). Design of experiments in chemical engineering. A practical guide. WILEY-VCH Verlag GmbH, Weinheim
- Leedy, PD , Ormrod, JE (2015). Practical Research: Planning and Design, Enhanced Pearson eText -- Access Card (11th Edition). Pearson Ltd., ISBN-13: 978-0133747188
- Gratzner, W. (2002). Eureka and Euphorias. The Oxford book of scientific anecdotes. Oxford University Press, Oxford. ISBN: 0-19-280403-0.

**REQUIREMENTS**  
**2018-2019 academic year, 1st semester**

**Name and code of the subject:** Theory of measurement and experimental design, MTMEL7001A

**Name and title of the person responsible for the subject:** Dr. Endre Máthé, associate professor PhD

**Additional instructors involved in teaching the subject:** -

**Name and level of the program:** Food safety and quality engineering MSc

**Subject type:** compulsory

**Teaching timetable of the subject, type of examination:** 2 lect. + 2 pract., oral

**Credit value of the subject:** 5

**Purpose of teaching the subject:**

Successful food development and quality control is based on the proper application of theory of measurement and experimental design. The students will become familiar with the STEM (Science-Technology-Engineering-Mathematics)-specific professional culture specificities and values. They will also learn about the logics STEM-type of research including the formulation of questions, definition of research object, elaboration and documentation of research activities, analysis of results, formulating the right conclusions and all these things together in the context of food development, quality control and food chain supply.

**Content of the subject (14 weeks):**

**LECTURES:**

1. The STEM- specific professional culture and values.
- 2-3. The STEM type of observation and research logics. The direct and indirect proofs type of research data.
- 4-5. Research publications types and their content, scientific writing style, ethical considerations.
- 6-7. Measurement of fundamental and derived properties, data collecting and interpreting. Presenting numerical data. Dimensions, units and equations.
- 8-9. Macro- and microscopic measurements techniques: mass-, volume- and cell number determination.
- 10-11. Research planning and implementation: choosing the right object to study, sample size allocation and the statistic method, documentation of observations and hypothesis analysis.
- 12-13. Analysis of research data: descriptive statistics and correlation analysis; publication of numerical data.
- 14-15. Food industrial applications: development of novel food prototypes based on quantitative and qualitative parameters. The EFSA and FDA.

**PRACTICALS:**

1. STEM specific informatics databases
- 2-3. Elaboration of research plans for food prototype development and quality assessment.
- 4-5. Scientific presentations and publications preparation based on the theoretical considerations related to the quality control of a developed food prototype.
- 6-7. Measurements based on calculi.
- 8-9. Determination of volume, mass and cell number in laboratory conditions.
- 10-13. Statistical analysis, problem solving.
- 14-15. Presentation of food prototype/quality concepts and evaluation.

**Type of mid-term examination:** participation in the practicals is mandatory. Attendance at 70% of the practicals is mandatory. In case of absence, a report must be submitted by the student within two weeks from the missed practice (theoretical and practical description). Participation in the practicals is a precondition for the final exam.

**Method of assessment (semester examination mark - report, practical grade, colloquium, examination):** practical grade

**Teaching aids:** lecture specific PPTs, research/review papers

**Recommended literature:**

- Adams, D.S. (2003). Lab Math. A handbook of measurements, calculations and other quantitative skills for use at bench. Cold Spring Laboratory Press. Cold Spring Harbour, New York. ISBN 0-87969-634-6.
- Davis, M. (1996). Scientific papers and presentations. Academic Press. San Diego, London. ISBN: 0-12-206370-8.
- Lazic, Z. (2004). Design of experiments in chemical engineering. A practical guide. WILEY-VCH Verlag GmbH, Weinheim
- Leedy, PD , Ormrod, JE (2015). Practical Research: Planning and Design, Enhanced Pearson eText -- Access Card (11th Edition). Pearson Ltd., ISBN-13: 978-0133747188
- Gratzner, W. (2002). Eureka and Euphorias. The Oxford book of scientific anecdotes. Oxford University Press, Oxford. ISBN: 0-19-280403-0.

## **REQUIREMENTS**

### **2018/2019. academic year I. semester**

**Name and code of the subject:** Élelmiszerekkel szembeni elvárások, fogyasztóvédelem (Expectation to foodstuff, consumer production), MTMEL7002A

**Name and title of the person responsible for the subject:** Dr. Nikolett Czipa, associate professor

**Additional instructors involved in teaching the subject:** Loránd Alexa, PhD student; Andrea Kántor, PhD student

**Name and level of the program:** Food Safety and Quality Engineering MSc

**Subject type:** compulsory

**Teaching timetable of the subject, type of examination:** 1+1, examination

**Credit value of the subject:** 3

**Purpose of teaching the subject:** The main aim of the lectures is to know the organisations, regulations and requirements which aims the production of safe food and consumer protection. Students will know the procedure of authorisation, the usage of applicable materials in food production, the requirements for trade in the EU and for import from third countries.

#### **Content of the subject (14 weeks):**

1. Introduction to food law (Regulation No. 178/2002/EC)
2. Labelling of foods
3. Geographical indicators, trade marks
4. Consumer habits
5. Consumer perception of food quality and safety
6. Additives and treatments in food production
7. Special foods
8. National Food Chain Safety Authority and EFSA
9. Food trade in the EU
10. Border control for foods from third countries
11. Authorization of food business
12. Catering
13. Communal catering
14. RASFF and INFOSAN

**Type of mid-term examination:** Attendance in the case of practical courses is compulsory. The acceptable extent of absences is 3 practical courses / semester. The Students have two tests in the session. At least 60% is required to satisfactory mark. If the Student fails to fulfil this we provide an occasion to repeat it in the educational period. Should the student fail this occasion as well, a new occasion must be offered until the end of the third week of the exam period to repeat the mid-term exam.

Criterion of signature: Active attendance on the practical courses.

**Method of assessment (semester examination mark - report, practical grade, colloquium, examination):** examination

**Teaching aids:** Slides of lectures

**Recommended literature:**

Nikolett Czipa (2017): Practical exercises for the course of expectation to foodstuff, consumer protection. Debreceni Egyetem

J.L. Pomeranz (2016): Food law for public health. Oxford University Press., New York.

J. Albert (2010): Innovations and food labelling. ISBN 978-1-84569-759-4

Regulaion, directives

**REQUIREMENTS**  
**2018/19. academic year 1<sup>st</sup> semester**

**Name and code of the subject:** Separation technique, MTMEL7003A

**Name and title of the person responsible for the subject:** Prof. Dr. János Csapó, professor

**Additional instructors involved in teaching the subject:** -

**Name and level of the program:** MSc in Food safety and quality engineer sciences, 1.

**Subject type:** compulsory

**Teaching timetable of the subject, type of examination:** 2 + 2, practice

**Credit value of the subject:** 5

**Purpose of teaching the subject:** Other methods for review of the knowledge of students: (ha vannak): The participation on the lectures is required in 80%. The condition of the acceptance of the semester is the writing of three essays from the material of the lectures for acceptable level at the 5., 9. and 13. week of the semester. Lectures should not be replaced. One essay can be rewrite with the permission of the head of Department approved by the head of Educational Department of the Faculty at the last week of the semester. If the above conditions are not receiving, the semester is not accepted, and the student can not participate in the colloquium either

**Content of the subject (14 weeks):**

1. The formation of chromatographic methods, they importance in food analysis. Grouping by the mechanism of separation, the form of stationary, and the aggregate of mobile phase.
2. Interactions between the investigated components and the stationary phase.
3. The aim of the liquid chromatography, details of the liquid chromatographic procedures, analytical semi preparative and preparative chromatographic methods. The normal and reserve phase chromatography, the stationary and mobile phases.
4. Comparison of the normal and reverse phase chromatography. Determination of the vitamins, amino acids and proteins by NP- and RP-HPLC.
5. The basic principles of ion exchange chromatography. Analysis of amino acids and proteins by ion exchange chromatography.
6. The basic principles of gel chromatography, and the areas of applications.
7. The principles and aim of gas chromatography, and the details of gas chromatographic procedures.
8. Adsorption and repartition. Isotherm of adsorption. The basic principles of adsorption and repartition chromatography.
9. Parts of gas chromatography, the different columns and stationary phase, the importance of capillary column.
10. Areas of application of gas chromatography. Determination of the fatty acid composition of fats by gas chromatography.
11. The importance and structure of mass spectrometer. Different types of mass spectrometers. Details of the functioning of the quadrupole mass analyser.
12. Advantages of the mass spectrophotometers compared the other detectors.
13. Application of mass spectrometer in gas- and high performance liquid chromatography. Gas chromatography-Mass spectrometry coupled technique (GC-MS).
14. Liquid chromatography-Mass spectrometry coupled technique (HPLC-MS). Other coupled chromatographic techniques (GC-GC, HPLC-HPLC).

**Type of mid-term examination:**

Assignments to be submitted

**Method of assessment (semester examination mark - report, practical grade, colloquium, examination):**

70 % attendance and fulfilment of the tasks is compulsory for the signature. Final grad is deduced from results of mid-term accomplishments and the results of the final exam.

**Teaching aids:**

To be find in e-learning

**Recommended literature:**

1. Kovács B – Csapó J.: Modern methods of food analysis. *University of Debrecen, Faculty of Agricultural and Food Science and Environmental Management*. Készült a TÁMOP-4.1.1.C-12/1/KONV-2012-0014. projekt keretében. 1-205.
2. Sparkman, O.D. – Penton, Z.E.- Kitson, F.G.: Gas Chromatography and Mass Spectrometry. A Practical Guide. *Elsevier*. 2011. 1-590.
3. Ardrey, R.E.: Liquid Chromatography – Mass Spectrometry. *Wiley*. 2003. 1-298.
4. Naushad, M.U. – Khan, M.R.: Ultra Performance Liquid Chromatography Mass Spectrometry. Evaluation and Application in Food Analysis. *CRC Press*. 2014. 1-464.
5. Fanali, S.- Haddad, P. – Poole, C. – Schoenmaker, P. – Lloyd, D.: Liquid Chromatography. Fundamentals and Instrumentation. *Elsevier*. 2013. 1-517.



## **REQUIREMENTS**

### **2018/2019. academic year I. semester**

**Name and code of the subject:** Élelmiszertechnológiák minőségbiztosítási és biztonsági kérdései (HACCP a gyakorlatban) (Quality and safety of food technologies (HACCP in practice)), MTMEL7004A

**Name and title of the person responsible for the subject:** Dr. Nikolett Czipa, associated professor

**Additional instructors involved in teaching the subject:** Loránd Alexa, PhD student; Andrea Kántor, PhD student

**Name and level of the program:** Food Safety and Quality Engineering MSc

**Subject type:** compulsory

**Teaching timetable of the subject, type of examination:** 2+1, examination

**Credit value of the subject:** 3

**Purpose of teaching the subject:** The main aim of the lectures is to know the hygiene requirements related to plant and animal origin food production, the structure of HACCP plan and the methodology of product description, manufacturing formula, hazard identification, hazard analysis, flow diagram preparation and corrective action determination. Until the end of the semester, student will be able to identify the physical, chemical and microbiological hazard in plant and animal origin food production, and they will be able to prepare a HACCP plan.

#### **Content of the subject (14 weeks):**

1. Food hygiene (Regulation No. 852/2004/EC)
2. Hygiene of animal origin foods (Regulation No. 853/2004/EC)
3. Physical and chemical hazards in food chain
4. Biological and microbiological hazards in food chain
5. Hazard analysis of production of milk and dairy products
6. Hazard analysis of production of egg and egg products
7. Hazard analysis of production of delicatessen foods
8. Hazard analysis of slaughtering (pork and beef)
9. Hazard analysis of production of meat products
10. Hazard analysis of production of meat products (poultry)
11. Hazard analysis of production of fish products
12. Hazard analysis of production of quick-frozen products
13. Hazard analysis of catering
14. Case studies

**Type of mid-term examination:** Attendance in the case of practical courses is compulsory. The acceptable extent of absences is 3 practical courses / semester. The Students have one tests in the session. At least 60% is required to satisfactory mark. If the Student fails to fulfil this we provide an occasion to repeat it in the educational period. Should the student fail this occasion as well, a new occasion must be offered until the end of the third week of the exam period to repeat the mid-term exam.

Criterion of signature: Active attendance on the practical courses and successful test.

**Method of assessment (semester examination mark - report, practical grade, colloquium, examination):** examination (individual project task)

**Teaching aids:** Slides of lectures

**Recommended literature:**

Nikolett Czipa (2017): Practical exercises for the course of food industry technologies and quality assurance. Debreceni Egyetem

2016/C 278/01 EU Commission notice on the implementation of food safety management systems covering prerequisite programs (PRPs) and procedures based on the HACCP principles, including the facilitation/flexibility of the implementation in certain food businesses

852/2004/EC regulation (2009): on the hygiene of foodstuffs

853/2004/EC regulation (2017): laying down specific hygiene rules for food of animal origin

Lelieveld, H., Holah, J., Gabric, D.: (2016): Handbook of Hygiene Control in the Food Industry. ISBN: 978-0-08-100197

Codex Alimentarius Commission: Food hygiene. Basic texts.  
(<http://www.fao.org/docrep/012/a1552e/a1552e00.pdf>)

## **REQUIREMENTS**

### **2018/2019 academic year 1 semester**

**Name and code of the subject:** Élelmiszer marketing (Food Marketing) MTMEL7005

**Name and title of the person responsible for the subject:** Dr. Zsolt Polereczki

**Additional instructors involved in teaching the subject:** Dr. Zsolt Polereczki

**Name and level of the program:** Food safety and quality engineer sciences (Master)

**Subject type:** compulsory

**Teaching timetable of the subject, type of examination:** 2+1 K

**Credit value of the subject:** 3

**Purpose of teaching the subject:** The goal of the subject is to make the student understand the basic contexts of the food marketing especially the segmentation, the targeting and positioning. The subject emphasizes the role of the marketing mix in the food markets therefore we study the product, the price, the place and promotion tools detailed. The community marketing tools and strategies are also part of the subject.

### **Content of the subject (14 weeks):**

#### **Lecture topics:**

1. Coordination of the requirements
2. Evolution of food marketing system – part 1.
3. Evolution of food marketing system – part 2.
4. Segmentation and new product development (from concept to shop), STP, product, price, place and promotion – part 1.
5. Segmentation and new product development (from concept to shop), STP, product, price, place and promotion – part 2.
6. Food consumption trends – part 1.
7. Food consumption trends – part 2.
8. Regional food systems – part 1.
9. Regional food systems – part 2.
10. Retailers strategies in fresh produce (case study: Short supply chains) – part 1.
11. Retailers strategies in fresh produce (case study: Short supply chains) – part 2.
12. Overview of a specific products' market (free from products) – part 1.
13. Overview of a specific products' market (free from products) – part 1.
14. Final presentation / semester summary

#### **Practice topics**

1. Coordination of the requirements
2. Evolution of marketing systems – Coca-Cola, the prime example of marketing – Case study analysis
3. Evolution of marketing systems – Coca-Cola, the prime example of marketing – Case study presentation
4. Segmentation and new product development – Red Bull, the brand getting wings – Case study analysis
5. Segmentation and new product development – Red Bull, the brand getting wings – Case study presentation
6. Food consumption trends – The characteristic of digital food consumer – Case study analysis

7. Food consumption trends – The characteristic of digital food consumer – Case study presentation
8. Regional food systems –Gedeon Totth – International practice of community agricultural marketing – Case study analysis
9. Regional food systems –Gedeon Totth – International practice of community agricultural marketing – Case study presentation
10. Retailer's strategies in fresh produce – Tesco, the world-class customer contact builder – Case study analysis
11. Retailer's strategies in fresh produce – Tesco, the world-class customer contact builder – Case study presentation
12. Overview of specific products' market –The story of delicious gluten free bread: the branding of Glulu – Case study analysis
13. Overview of specific products' market –The story of delicious gluten free bread: the branding of Glulu – Case study presentation
14. The student present the final presentation.

**Type of mid-term examination: -**

**Method of assessment (semester examination mark - report, practical grade, colloquium, examination):**

Students must process a case study in the field of food marketing by the end of the semester by an oral presentation. Students must complete a written exam at the end of the semester.

The presentation and the written exam will be evaluated together.

Students can earn 100 points during the semester. The presentation is 50% (50 points), with 50% (50 points) for written exam. Students must also meet the minimum level for presentation and written exam, so they need to reach 51% of the points. During the semester students can earn extra points through active participation in the lessons.

Presentation (50% of the final 100 points): During the oral presentation, students should be given 10 minutes of lectures and they will be present it in one of the last lessons.

Written exam (50% of the final 100 points): The written exam consists of five sections (multiple choices (10 points), true or false (10 points) and three short essays (3\*10 points). Students will write the exam during the exam period or pre-exam with the appropriate progress of the semester.

**Teaching aids:** Collection of case studies

**Recommended literature:**

1. Rachel E. Helwig (2015): Transparent Food Marketing: A Clear Understanding of Food Marketing Terminology. CreateSpace Independent Publishing Platform; First edition. pp. 1-112 ISBN: 9781514869864
2. Stephen F. Hall (2015): Sell Your Specialty Food: Market, Distribute, and Profit from Your Kitchen Creation. Stephen F. Hall; 6th edition. pp. 1-210. ISBN: 9780692572078
3. Gordon W. Fuller (2011): New Food Product Development: From Concept to Marketplace, Third Edition. CRC Press; 3 edition. pp. 1-508. ISBN: 9781439818640

## **REQUIREMENTS**

### **2018/19. tanév I. félév**

**A tantárgy neve, kódja:** Élelmiszer-mikrobiológia alapjai, MTMEL7006

**A tantárgyfelelős neve, beosztása:** Dr. Karaffa Erzsébet Mónika, egyetemi docens

**A tantárgy oktatásába bevont további oktatók:** Dr. Pál Károly, tudományos főmunkatárs

**Szak neve, szintje:** Élelmiszerbiztonsági és –minőségi mérnöki, MSc

**Tantárgy típusa:** kötelező

**A tantárgy oktatási időterve, vizsga típusa:** 2, K

**A tantárgy kredit értéke:** 3

#### **A tárgy oktatásának célja:**

The aim of the subject is to provide basic knowledge about microbiology for the “microbiological aspects of food safety and quality” and “Microbiological rapid methods” and “Food toxicology” subjects. Students will be introduced into the cell structure, metabolism and genetics of the microorganisms. We will discuss the most important phylogenetic groups and characteristics of prokaryotes and eukaryotes and viruses, and the intrinsic and extrinsic parameters of foods that affect microbial growth. Different food preservation methods will be discussed.

#### **A tantárgy tartalma (14 hét bontásban):**

1. Metabolism and culture of microbes.
2. Structure of prokaryotic cells.
3. Structure of eukaryotic cells.
4. Basic microbial genetics.
5. Methods of microbial taxonomy.
6. Most important prokaryotic taxons and their characteristics.
7. Characteristics and taxonomy of fungi.
8. Characteristics and taxonomy of protozoa.
9. Extrinsic parameters of foods that affect microbial growth I.
10. Extrinsic parameters of foods that affect microbial growth II.
11. Intrinsic parameters of foods that affect microbial growth.
12. Physical preservation methods
13. Chemical preservation methods
14. Biological preservation methods and new techniques for food preservations..

#### **Évközi ellenőrzés módja:** -.

**Számonkérés módja** (félévi vizsgajegy kialakításának módja – beszámoló, gyakorlati jegy, kollokvium, szigorlat): kollokvium

**Oktatási segédanyagok:** az előadások diásorai

#### **Ajánlott irodalom:**

Jay, J. M., Loessner, M. J., Golden, D. A. (2005): Modern Food Microbiology. ISBN 978-0-387-23413-7

Adams, M. R., Moss M. O. (2008): Food Microbiology. The Royal Society of Chemistry. ISBN 978-0-85404-284-5

Karaffa E., Peles F (2014): Microbiological Aspects of Food Quality And Safety. Debreceni Egyetem, Debrecen.

Madigan, M. T, Martinko, J. M., Bender K., Buckley, D., Stahl, D (2015): Brock Biology of Microorganisms, Benjamin Cumming, 14th edition 1030 oldal, ISBN 978-1-292-01831-7

## **REQUIREMENTS**

### **2018/19 academic year 1. semester**

**Name and code of the subject:** Vezetési és kommunikációs ismeretek MTMEL7007A

**Name and title of the person responsible for the subject:** Dr. habil JUHÁSZ, Csilla  
Associate professor

**Additional instructors involved in teaching the subject:** -

**Name and level of the program:** Food safety and quality assurance engineer MSc

**Subject type:** compulsory

**Teaching timetable of the subject, type of examination:** 1+1 E

**Credit value of the subject:** 3

**Purpose of teaching the subject:** Let students recognize those basic management theories, methods, proceedings and communication techniques, which helps to practice effective managerial tasks.

#### **Content of the subject (14 weeks):**

1. Basic communication
2. Nonverbal communication
3. Verbal communication, written
4. Verbal communication, oral
5. Communicational barriers
6. Management and organizational communication
7. Business communication
8. Management vs leadership
9. Management schools
10. Managerial tasks
11. Management styles and methods
12. Organisation forms
13. Motivation
14. Conflict and conflict handling

#### **Type of mid-term examination:**

Attendance is required. Students are required to complete any homework and necessary preparation for the lessons as requested by the teacher.

To get the credits students have to fulfil the requirements of both the lectures and the seminars and sit for a written exam at the end of the semester. The final grade is calculated on the basis of the written examination and the seminar performance. If either the written examination or the seminar performance is a failing grade i.e. 1, the final grade will automatically become a fail i.e. 1. The calculation is the following: <60% – 1; 61% – 2; 71% – 3; 81% – 4; 91% – 5.

**Method of assessment (semester examination mark - report, practical grade, colloquium, examination):** EXAMINATION

**Teaching aids:** The slides of lecture

**Recommended literature:**

Guffey, Mary Ellen – Loewy, Dana: Essential of Business Communication.

<http://www.cengagebrain.com.mx/content/9781133991465.pdf>

Allan Pease: Bodylanguage

McLean, S. (2005). The basics of interpersonal communication. Boston, MA: Allyn & Bacon

Pearson, J., & Nelson, P. (2000). An introduction to human communication: Understanding and sharing. Boston, MA: McGraw-Hill

Ricky Griffin. (11ed.): Management

Richard. L. Daft: management. 9th ed.

C.K. Prahalad: The fortune at the bottom of the pyramid.

Earl Babbie: The practice of social research.

Jared Diamond: Collapse.How societies choose to fail or succeed.

## **REQUIREMENTS**

### **2018/19 academic year I. semester**

**Name and code of the subject:** Hyphenated analytical methods, MTMEL7015A

**Name and title of the person responsible for the subject:** Dr. Béni Áron, assistant professor

**Additional instructors involved in teaching the subject:** -

**Name and level of the program:** Food Safety and Quality Engineering MSc

**Subject type:** lecture and laboratory practice

**Teaching timetable of the subject, type of examination:** 1+1 C

**Credit value of the subject:** 3

#### **Purpose of teaching the subject:**

The task of the subject is: the students get acquainted with the grouping and applicability of the most important attached analytical systems. The students will get a detailed educational material (theoretical and practical knowledge) for the most important attached analytical systems (HPLC–UV/VIS and HPLC–DAD, HPLC–ICP-MS, LC-MS, GC-MS). It will detail the importance and process of the speciation analytics, moreover it will give specific examples for application of an attached analytical system.

#### **Content of the subject (14 weeks):**

##### *The topics of the lectures:*

- 1. week:** grouping of the attached techniques.
- 2-3. weeks:** application possibilities of HPLC–UV/VIS and HPLC–DAD systems
- 4-5. weeks:** separation and detection possibilities of elemental speciation analytical methods (HPLC–ICP-OES, HPLC–ICP-MS, moreover non-chromatographic analytical methods)
- 6. week:** advantages and disadvantages of different elemental speciation analytical methods
- 7-8. weeks:** sampling and sample preparation methods for elemental speciation analytical methods
- 9. week:** application possibilities of a liquid chromatograph mass spectrometer (LC-MS)
- 10. week:** application possibilities of gas chromatograph mass spectrometer (GC-MS)
- 11. week:** introduction and possibilities of analytical techniques of arsenic species
- 12. week:** introduction and possibilities of analytical techniques of selenium species
- 13. week:** introduction and possibilities of analytical techniques of mercury species
- 14. week:** introduction and possibilities of analytical techniques for species of other elements

##### *The topics of laboratory exercises:*

- 1. week:** education of prevention of accidents, introduction of laboratory order and each laboratory exercises
- 2-3. weeks:** sampling and sample preparation methods of food raw materials and food productions for elemental speciation analyses
- 4-5. weeks:** sampling and sample preparation methods of food raw materials and food productions for determination of organic compounds
- 6-8. weeks:** analysis of chromium(III) and chromium(VI) species contents in the previously prepared samples of food raw material and food production using aluminium-oxide micro column and inductively coupled plasma optical emission spectrometer (MC–ICP-OES).
- 9-11. weeks:** analysis of selenium(IV) and selenium(VI) species contents in the previously



prepared samples of food raw material and food production using ion chromatograph and inductively coupled plasma mass spectrometer (IC–ICP-MS).

**12-14. weeks:** identification and analysis of contents of various organic compounds in the previously prepared samples of food raw material and food production using gas chromatograph–mass spectrometer

**Type of mid-term examination:**

Have to write one test, it must reach above 50% of points.

Attendance at the practice is mandatory

**Method of assessment (semester examination mark - report, practical grade, colloquium, examination):**

After the successfully written test, the oral exam is available.

The percentage of the points conversion to grades:

80 – 100	5
70 – 79	4
60 – 69	3
50 – 59	2
0 – 49	not accepted (1)

**Teaching aids:**

Dr. Áron Béni E-learning Hyphenated analytical methods

Dr. Áron Béni Practical Exercises for the Course of Hyphenated Analytical Techniques

Dr. Rita Erdeiné Kremper Practical Exercises for the Course of General and Inorganic Chemistry

**Recommended literature:**

1. Cornelis, R., Crews, H., Caruso, J., Heumann, K. 2003. Handbook of Elemental Speciation: Techniques and Methodology John Wiley & Sons, Ltd. ISBN: 0-471-49214-0
2. Cornelis, R., Crews, H., Caruso, J., Heumann, K (editor) 2005. Handbook of Elemental Speciation II: Species in the Environment, Food, Medicine & Occupational Health. John Wiley & Sons, Ltd. ISBN: 0-470-85598-3 (HB)
3. Ure, A.M., Davidson, C.M. 2002. Chemical Speciation in the Environment, Blackwell Science Ltd. ISBN 0-632-05848-X
4. Joanna Szpunar, J., Lobinski, R. (Editors) 2003. Hyphenated Techniques in Speciation Analysis. The Royal Society of Chemistry. Cambridge, UK. 252 p. ISBN: 978-0-85404-545-7
5. Ruth Waddell, Cris Lewis, Wei Hang, Chris Hassell and Vahid Majidi: (2005) Inductively Coupled Plasma Mass Spectrometry for Elemental Speciation: Applications in the New Millennium. Applied Spectroscopy Reviews, 40:33–69.

**REQUIREMENTS**  
**2018/2019 academic year I. semester**

**Name and code of the subject:** Quality management systems and audit in the food chain.  
**MTMEL7016A**

**Name and title of the person responsible for the subject:** Dr. Ferenc Peles, assistant professor

**Additional instructors involved in teaching the subject:** -

**Name and level of the program:** food safety and quality engineering MSc

**Subject type:** obligatory

**Teaching timetable of the subject, type of examination:** 2+2 C

**Credit value of the subject:** 4

**Purpose of teaching the subject:** The aim of the subject is the introduction of the standards, furthermore the development, operation and certification of the quality, environmental and food safety systems.

**Content of the subject (14 weeks):**

1. Introduction. Definitions.
2. Evolution of quality management
3. GMP
4. GHP
5. GAP
6. GLOBALGAP
7. HACCP
8. ISO 9000, ISO 9001, ISO 9004
9. ISO 14001
10. ISO 22000
11. GFSI, FSSC 22000
12. BRC Global Standard for Food Safety
13. IFS Food Standard
14. Auditing of management systems

**Type of mid-term examination:** mid-year written exams

**Method of assessment (semester examination mark - report, practical grade, colloquium, examination):** colloquium

**Teaching aids:** PPT slides

**Recommended literature:**

Peles, F. – Juhász, Cs. (2014): Quality assurance. University lecture notes. University of Debrecen. /ISBN 978-963-473-656-1/ TÁMOP 4.1.2.A/1-11/1-2011-0009. 177p.

Vasconcellos, J.A. (2004): Quality Assurance for the Food Industry. A Practical Approach. CRC Press. 448 p.

Jacxsens, L. – Devlieghere, F. – Uyttendaele, M. (2009): Quality Management Systems in the Food Industry. Ghent University. 153p..

## **REQUIREMENTS**

### **2018/2019 academic year I. semester**

**Name and code of the subject:** Traceability in the food chain. MTMEL7017A

**Name and title of the person responsible for the subject:** Dr. Ferenc Peles, assistant professor

**Additional instructors involved in teaching the subject:** -

**Name and level of the program:** food safety and quality engineering MSc

**Subject type:** obligatory

**Teaching timetable of the subject, type of examination:** 1+1 C

**Credit value of the subject:** 3

**Purpose of teaching the subject:** The purpose of this subject is to familiarize the student with the concepts, basics and objectives of traceability, regulations and standards related to traceability, furthermore the tracing and tracking techniques in practice.

**Content of the subject (14 weeks):**

1. Introduction. Definitions.
2. The relationship between the food chain safety and traceability
3. Aims, significance and benefits of traceability
4. Types of tracing procedures and their characteristics
5. Regulations and standards related to food traceability
6. Follow-up systems in case of plant origin foods
7. Follow-up systems in case of animal origin foods
8. TIR and ENAR system
9. GS1 system
10. GS1 standards
11. Types of bar codes and their characteristics.
12. RFID system
13. Application of RFID technology in traceability
14. Design and implementation of a traceability system

**Type of mid-term examination:** mid-year written exams

**Method of assessment (semester examination mark - report, practical grade, colloquium, examination):** colloquium

**Teaching aids:** PPT slides

**Recommended literature:**

Schiffers, B. (2011): Traceability. COLEACP-PIP programme, training manual 2. 118 p.  
Regulation (Ec) No 178/2002 of The European Parliament and of The Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety  
Commission Implementing Regulation (EU) No 931/2011 of 19 September 2011 on the traceability requirements set by Regulation (EC) No 178/2002 of the European Parliament and of the Council for food of animal origin  
ISO 22005:2007. Traceability in the feed and food chain. General principles and basic requirements for system design and implementation.

**REQUIREMENTS**  
**2018/19 academic year I. semester**

**Name and code of the subject: Environmental Aspects of Food Processing**  
**MTMEL7023A**

**Name and title of the person responsible for the subject:**

**Additional instructors involved in teaching the subject: Prof Dr. János Tamás Professor**

**Name and level of the program: Food Safety and Quality Engineering MSc**

**Subject type: optional**

**Teaching timetable of the subject, type of examination: 3 K**

**Credit value of the subject: 4**

**Purpose of teaching the subject:**

**Content of the subject (14 weeks):**

15. Basics of environmental status of a country. Definition, structure and development of environmental protection and environmental management. Natural resources and their types, continuous, non-renewable, and renewable natural resources. The concept of environment, its elements, pollution sources, causes, forms.
16. Air pollution and pollution control.
17. Soil contamination and degradation: soil contamination and contaminants, erosion.
18. Water pollution and protection against pollution. Water quality, water quality protection. The system of Water Management.
19. Noise and vibration protection.
20. Waste management: The concept of waste, its sources and effects.
21. International scope of agri-environmental management. Introduction of the Hungarian practice as an example.
22. The impact of agricultural production on the environment: environmental effects of plant production, environmental aspects of animal husbandry. Environmental impact assessments.
23. General environmental impacts of food production and processing.
24. Specific environmental effects of food production and processing I.
25. Specific environmental effects of food production and processing II.
26. Cleaner production techniques.
27. Environmental management systems.
28. Life cycle analysis. Environmental indicators. BAT (Best Available Techniques).

**Type of mid-term examination:** Active participation at the lessons is required.

**Method of assessment (semester examination mark - report, practical grade, colloquium, examination):** Written exam

**Teaching aids:**

**Recommended literature:**

1. J. C. Lovett- D. G. Ockwell.: 2010. A Handbook of Environmental Management.
2. J.M. Blais, M. Rosen, J.P. Smol.: 2015. Environmental Contaminants.
3. A. S. Kalamdhad, J. Singh, K. Dhamodharan.: 2016. Advances in Waste Management.
4. V. I. Grover.: 2006. Water: Global Common and Global Problems.

## **REQUIREMENTS**

**2018/2019. academic year I. semester**

**Name and code of the subject: Medicinal plants and their processing, MTMEL7025A**

**Name and title of the person responsible for the subject:** Dr. Erika Tünde Kutasy, assistant professor

**Additional instructors involved in teaching the subject:**

**Name and level of the program:** Food Safety and Quality, MSc

**Subject type:** compulsory

**Teaching timetable of the subject, type of examination:** 1+2 C

**Credit value of the subject:** 3

### **Purpose of teaching the subject:**

The aim of the course is to give informations about the significance of medicinal and aromatic plants production in Hungary and in the world. Uses of medicinal plants. Classification of medicinal plants. Active ingredients of medicinal plants. Quality assurance of drugs. The production technologies of the most important herb species in Hungary. Wild collection of medicinal plants. The most important wild-harvested herbs in Hungary. Primary processing of medicinal and aromatic plants.

### **Content of the subject (14 weeks):**

1. Medical plant production in Hungary and in the world. Agroecological conditions of production. Drugs and their systematization.
2. Genetical background of medical and spice crops farming. Gathering of medical plants.
3. General and specific methods of production technology of medicine and aromatic plants.
4. Possibilities and practice of aromatic plant production in organic farming.
5. Processing and storing of medical and aromatic crops, extraction of active substances.
6. Qualifying of herbs.
7. Production of annual herbs: (*Claviceps purpurea*, *Coriandrum sativum*, *Anethum graveolens*, *Carum carvi*).
8. *Majorana hortensis*, *Pimpinella anisum*, *Ocimum basilicum* production
9. *Satureja hortensis*, *Matricaria chamomilla*, *Calendula officinalis* production
10. Production of biennial herbs: (*Foeniculum vulgare*, *Digitalis lanata*, *Digitalis purpurea*, *Salvia sclarea*).
11. Production of perennial herbs: (*Mentha piperita*, *Lavandula angustifolia*, *Melissa officinalis*).
12. *Hyssopus officinalis*, *Thymus vulgaris*, *Levisticum officinale* production.
13. *Valeriana officinalis*, *Salvia officinalis* production.
14. *Papaver somniferum* production.

### **Type of mid-term examination:**

- Completing assignments
- Giving a short presentation

**Method of assessment (semester examination mark - report, practical grade, colloquium, examination):** colloquium

**Teaching aids:** lecture material

**Recommended literature:**

Hornok, L. (1992) Cultivation and Processing of Medicinal Plants. John Wiley & Sons Ltd, Baffins Lane, Chichester, UK 338. p. ISBN 0-471-92383-4

WHO guidelines on good agricultural and collection practices (GACP) for medicinal plants. World Health Organization Geneva (2003)

## **REQUIREMENTS**

### **2018/19 academic year 1. semester**

**Name and code of the subject:** Innováció-menedzsment MTMEL7036A

**Name and title of the person responsible for the subject:** Dr. habil JUHÁSZ, Csilla  
Associate professor

**Additional instructors involved in teaching the subject:** -

**Name and level of the program:** Food safety and quality assurance engineer MSc

**Subject type:** optional

**Teaching timetable of the subject, type of examination:** 1+1 E

**Credit value of the subject:** 3

**Purpose of teaching the subject:** This subject gives a thinking frame and practical methodology of preparation for innovational managerial decision making and implementation. Their knowledge can be used for modernizing products, services, processes, technologies, Competitiveness increasing of forprofit and nonprofit sectors and renewing of elements of organizational system's.

#### **Content of the subject (14 weeks):**

15. What is innovation? (definition, process)
16. Conceptions, models of innovation
17. Strategy of innovation
18. Financing of innovation
19. Management of innovation
20. Management of technology
21. Measurement of innovation
22. Influence of innovation
23. Methodology of innovation
24. European policy of innovation
25. American policy of innovation
26. Asian policy of innovation
27. Creative industry and innovation
28. Environment of innovation

#### **Type of mid-term examination:**

Attendance is required. Students are required to complete any homework and necessary preparation for the lessons as requested by the teacher.

To get the credits students have to fulfil the requirements of both the lectures and the seminars and sit for a written exam at the end of the semester. The final grade is calculated on the basis of the written examination and the seminar performance. If either the written examination or the seminar performance is a failing grade i.e. 1, the final grade will automatically become a fail i.e.1. The calculation is the following: <60% – 1; 61% – 2; 71% – 3; 81% – 4; 91%– 5.

**Method of assessment (semester examination mark - report, practical grade, colloquium, examination):** EXAMINATION

**Teaching aids:** The slides of lecture

**Recommended literature:**

4. Trott, Paul (2017): Innovation Management and New Product Development. Prentice Hall. Harlow England (6. ed)
5. [Joe Tidd](#); [John Bessant](#) (2016): Managing innovation : integrating technological, market and organizational change. Chichester, West Sussex : Wiley (5-th ed)
6. S. Maital - D.V.R. Seshadri (2007): Innovation management. Sage Publications Ltd London
7. E.G. Carayannis et al., (2015) *Innovation and Entrepreneurship*, Innovation, Technology, and Knowledge Management, Springer International Publishing Switzerland, DOI 10.1007/978-3-319-11242-8\_2
8. Scott Shane (ed): Handbook of Technology and Innovation Management, A John Wiley and Sons, Ltd.,
9. <http://bookboon.com/en/management-and-strategy-ebooks>



## **REQUIREMENTS**

### **2018/2019. tanév I. félév**

**A tantárgy neve, kódja:** Élelmiszer logisztika (Food logistics), MTMEL7038A

**A tantárgyfelelős neve, beosztása:** Dr. Felföldi János, egyetemi docens

**A tantárgy oktatásába bevont további oktatók:** Horváth Adrienn, predoktor

**Szak neve, szintje:** Food Quality and Safety Engineering MSc (Élelmiszerbiztonsági és -minőségi mérnöki MSc, angol)

**Tantárgy típusa:** szabadon választható

**A tantárgy oktatási időterve, vizsga típusa:** 1+2 K

**A tantárgy kredit értéke:** 4

**A tárgy oktatásának célja:** To get students acquainted with the theoretical and practical parts of logistics and their applications in the chain. Our aim is to introduce the basics of modern logistics based on the main functions and processes serving the goods flow. Students will be able to evaluate and discuss specific cases using their knowledge gained about theory on lectures.

**A tantárgy tartalma (14 hét bontásban): Course content, topics:**

1. Introduction to supply chain and logistics management
2. Food supply chains
3. Logistics
4. Retailing
5. Production and Manufacturing
6. Sourcing and procurement
7. Technology trends in supply chains
8. Risk management
9. Regulation, safety and quality
10. Collaboration and relationship
11. Security and future challenges
12. Challenges in international supply chains
13. Supply chain and logistics performance
14. Sustainability in supply chains

**Évközi ellenőrzés módja:** Requirements that must be met by each student within the semester and are specified and communicated by the course master are definitely related to the topics discussed in the course. Terms of course completion is giving the presentations by each student.

**Számonkérés módja** *(félévi vizsgajegy kialakításának módja – beszámoló, gyakorlati jegy, kollokvium, szigorlat):* Final grade results in a grade from 1 to 5 which grade will be calculated as a combined one with those results coming from the performances (presentations) over the semester.

**Oktatási segédanyagok:** ppt presentations

**Ajánlott irodalom:**

Dani, S. (2015): Food supply chain management and logistics. pp 260, KoganPage, ISBN: 9780 7494 7364 8

Deloitte (2013): The food value chain: a challenge for the next century. Deloitte Touche Tohmatsu, London.

## **REQUIREMENTS**

**2018/2019. academic year II. semester**

**Name and code of the subject:** Molecular biology, MTMEE006

**Name and title of the person responsible for the subject:** Dr. Pál Pepó, professor

**Additional instructors involved in teaching the subject:**

**Name and level of the program:** Food Safety and Quality Engineering, MSc

**Subject type:** optional

**Teaching timetable of the subject, type of examination:** 2+2, C

**Credit value of the subject:** 5

### **Purpose of teaching the subject:**

The aim is to give up to date knowledge about the molecular biology and biotechnology. Students will learn about the DNA, RNA and protein structure, synthesis, importance and isolation. This course instructs students in recombinant DNA techniques and other essential molecular biology techniques.

### **Content of the subject (14 weeks):**

1. Terminology (important terms)
2. Basics and history
3. Biotechnology of the asexual reproduction
4. Biotechnology of the sexual reproduction
5. Manipulation of DNA
6. Plant regeneration/molecular selection
7. Genetically modified plants
8. Basis of plant breeding
9. New alternatives in plant breeding
10. Resistance breeding
11. Quality breeding
12. Genetic manipulation in agricultural environment
13. Regeneration of maize and inhibition of pollen grain germination
14. Haploid production of wheat

### **Type of mid-term examination:**

- Before examination students need to get signature of the course instructor.
- Special requests will be accepted in the first 2 weeks of the semester only.
- Participation is compulsory on the lectures and seminars.

**Method of assessment (semester examination mark - report, practical grade, colloquium, examination):** colloquium

**Teaching aids:** lecture material

### **Recommended literature:**

Pal Pepo (2012): Basic molecular genetics elektronikus formában elérhető könyv

Pal Pepo (2012): Basic molecular genetics elektronikus formában elérhető könyv

Bidlack, J., Stern, K.R. Stern's introductory Plant biology. ISBN1259682749

Chrispeels, M.J., Gepts, P.: Plants, genes, and agriculture: Sustainability through biotechnology. 1th Edition. ISBN1605356840

Xiaoxian, h., Po, H., Ding, Y.: Contemporary biotechnology and bioengineering. ISBN 1842655574

Streit, W.R., Daniel, R.: Metagenomics: Methods and protocols. ISBN978-1493966899

Bains, W.: Biotechnology from A to Z. ISBN1432567210

Clark, D.P.: Biotechnology: Applying the genetic revolution. ISBN978-0121755522

Kreuzer, H.: Molecular biology and biotechnology: A guide for students. ISBN978-1555814724

**REQUIREMENTS**  
**2018/19. academic year 2<sup>nd</sup> semester**

**Name and code of the subject: Modern methods of food analysis I. Spectroscopy MTMEL7008A**

**Name and title of the person responsible for the subject: Prof. Dr. Béla Kovács, professor**

**Additional instructors involved in teaching the subject: Áron Soós**

**Name and level of the program: MSc in Food safety and quality engineer sciences, 2.**

**Subject type: compulsory**

**Teaching timetable of the subject, type of examination: 2 + 2**

**Credit value of the subject: 5**

**Purpose of teaching the subject:** The task of the subject is: the students get acquainted with the most important instrumental analytical measurement methods, which are necessary to determine the quality and quantity of food raw materials and food productions. What the students learned already within the frame of the similar subject (Instrumental analytics) on the Food Engineering BSc. course, their knowledge will extend and they will get a more detailed educational material (theoretical and practical knowledge) for instrumental measurement techniques (UV-VIS absorption spectrophotometry, FAAS, GF-AAS, ICP-OES, ICP-MS). The performance characteristics of analytical methods, moreover the simplified diagram of a multielemental chemical analysis will be detailed also.

**Content of the subject (14 weeks):**

1. week: The science of colloid, historical overview, the concept of the colloidal state, the classification and general characterization of colloidal systems.
2. week: The grouping of material systems, classifications of colloidal systems, grouping on the basis of the dispersed nature and the interactions between the particles.
3. week: Factors determining properties of colloidal systems, the shape of a disperse system, the size of the dispersed parts, general characterization of the major systems, incoherent systems.
4. week: Aero disperse systems, liquid medium disperse systems, gas dispersions, foams.
5. week: Suspensions, emulsions, solid medium disperse systems, macromolecular colloidal solutions, association colloids.
6. week: Coherent systems, gels, liquid medium concentrated disperse systems
7. week: Dry powder agglomerations, solid foams, solid macromolecules, kinetic regularities.
8. week: General descriptions of the most important laws. Brownian motion, diffusion, osmosis, sedimentation, stability of disperse systems.
9. week: Coagulation, stability and coagulation of suspensions, stability of foams, status changes of gels.
10. week: Rheological properties, rheological basic concepts, deformations, elastic deformations, flows.
11. week: The concepts of strength and consistency, behavior of non-Newtonian liquids, rheology of colloidal systems, viscosity of disperse systems, flow of suspensions.
12. week: Viscosity of solutions of yarn shaped polymer molecules, viscosity of emulsions, structural viscosity of disperse systems, main food colloidal systems, food suspensions, food emulsions, food gels.

13. week: Protein gels, polysaccharide gels, food foams.

14. week: Food complex colloidal systems, food dual systems, other colloidal stabilizers.

**Type of mid-term examination:**

Assignments to be submitted

**Method of assessment (semester examination mark - report, practical grade, colloquium, examination):**

70 % attendance and fulfilment of the tasks is compulsory for the signature. Final grade is deduced from results of mid-term accomplishments and the results of the final exam.

**Teaching aids:**

To be found in e-learning

**Recommended literature:**

Cosgrove T.: 2005. Colloid Science, Principles, Methods and Applications. Bristol, UK. Blackwell Publishing Ltd.

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

Fennema O.: 1996. Food Chemistry, Marcel Dekker.

Mohsenin N.N.: 1986. Physical properties of plant and animal materials, Gordon and Breach Science publishers, New York.

Ludger O. Figura, Arthur A. Teixeira: 2007. Food Physics, Springer, Heidelberg.

## **REQUIREMENTS**

### **2018-2019 academic year, 2nd semester**

**Name and code of the subject:** Essential molecular cell biology, MTMEL7010A

**Name and title of the person responsible for the subject:** Dr. Endre Máthé, associate professor PhD

**Additional instructors involved in teaching the subject:** -

**Name and level of the program:** Food safety and quality engineering MSc

**Subject type:** compulsory;

**Teaching timetable of the subject, type of examination:** 2 lect. + 2 pract. 2nd semester, oral

**Credit value of the subject:** 4

#### **Purpose of teaching the subject:**

Students will understand and the structural and functional properties of eukaryotic cells, and will learn to analyse and interpret the spatial and temporal control of stochastic and determinative cellular phenomena in the context of cellular compartmentalization, cell cycle regulation, genomic integrity and evolution. Special emphasis will be put on topics like the nutrition and health/diseases type of correlations; the preventive and therapeutic nutrition; the functional and medical foods,

#### **Content of the subject (14 weeks):**

##### **LECTURES:**

Course objectives:

1-3. Analysis of cellular and molecular levels of organization of living material, and system biology type of investigation methods.

4-5. Regulation of eukaryotic gene expression: transcription, translation, protein folding and degradation. The genomic integrity.

6-7. Epigenetic regulation of gene expression. Morphogenetic events and cell differentiation. Diurnal cycle.

8-9. Eukaryotic cells metabolism and energetic management, and the regulation of cellular homeostasis.

10-11. Cellular redox potential, ageing and adaptive stress responses.

12-13. Transgenic organisms and genetically modified foods.

14. The cellular basis of preventive nutrition.

##### **PRACTICALS:**

1-2. Assessment of cellular viability and toxicity.

3-4. Molecular investigation methods.

5-8. PCR cloning, CRISP/CAS9 genome editing and analysis of transgenic organisms.

9-10. Data mining using bioinformatics databases.

11-14. In silico genome-, proteome- and interactome analysis.

**Type of mid-term examination:** participation in the practicals is mandatory. Attendance at 70% of the practicals is mandatory. In case of absence, a report must be submitted by the student within two weeks from the missed practice (theoretical and practical description).

Participation in the practicals is a precondition for the final exam.

**Method of assessment (semester examination mark - report, practical grade, colloquium, examination):** colloquium

**Teaching aids:** lecture specific PPTs, research/review papers

**Recommended literature:**

- Alberts, B., Brey, D., Hopkin, K., Johnson, A., Lewis, J., Raff, M., Roberts, K., Walter, P. (2016). Essential cell biology. 4th edition. Garland Science, Taylor & Francis Group, New York, USA. ISBN-13: 978-0815344544
- Alberts, B., Johnson, A., Lewis, J. Morgan, D., Raff, M., Roberts, K., Walter, P. (2014). Molecular Biology of the Cell. Sixth Edition. Garland Science, Taylor & Francis Group, New York. ISBN-13: 978-0815344322
- Pollard, T.D., Earnshaw, W.C., Lippincott-Schwartz, J. and Johnson, G. (2017). Cell Biology, 3rd Edition, Elsevier, ISBN: 9780323341264
- PUBMED database

## **REQUIREMENTS**

### **2018/19. tanév II. félév**

**A tantárgy neve, kódja:** Élelmiszer minőség és biztonság mikrobiológiai vonatkozásai, MTMEL009

**A tantárgyfelelős neve, beosztása:** Dr. Karaffa Erzsébet Mónika, egyetemi docens

**A tantárgy oktatásába bevont további oktatók:** Dr. Peles Ferenc, egyetemi adjunktus, Dr. Pál Károly, tudományos főmunkatárs

**Szak neve, szintje:** Élelmiszerbiztonsági és –minőségi mérnöki, MSc

**Tantárgy típusa:** kötelező

**A tantárgy oktatási időterve, vizsga típusa:** 2+2, Gy

**A tantárgy kredit értéke:** 4

#### **A tárgy oktatásának célja:**

The aim of the subject is to provide knowledge about the foodborne pathogens and foodborne diseases. The microbiota of the different food products, and their characteristic microbiota, focusing on the microbes causing spoilage and foodborne pathogens.

Basic skills and knowledge during the practice enables student to plan and do food microbiological examinations for quality detection.

#### **A tantárgy tartalma (14 hét bontásban):**

1. History of Microorganisms in Food. Role, and Significance of Microorganisms in Foods. Microorganisms and food materials.
2. Introduction to Foodborne Pathogens. Faecal-oral infection route of foodborne pathogens. The pathogenesis of foodborne diseases. Az élelmiszer eredetű kórokozók patogenitásának helyei.
3. Food Poisoning Caused by Gram-Positive Spore-forming.
4. *Staphylococcus aureus* and staphylococcal gastroenteritis. Az ételmérgezésekben szerepet játszó *Staphylococcus aureus*. *Listeria monocytogenes* and foodborne listeriosis.
5. *Salmonella* genus and foodborne gastroenteritis caused by *Salmonella*.
6. *Escherichia coli* and foodborne gastroenteritis caused by *Escherichia coli*.
7. *Shigella* genus and shigellosis. *Yersinia* genus and yersiniosis. *Vibrio* genus and vibriosis. *Campylobacter* genus and campylobacteriosis.
8. Mycotoxigenic fungi and mycotoxins.
9. Foodborne Viruses and parasites.
10. Microorganisms in fresh meats and poultry. Microorganisms in processed meats and seafoods.
11. Microorganisms in milk, fermentation, and fermented and nonfermented dairy products.
12. Microorganisms in vegetable and fruit and in their products. Microorganisms in soft drinks and bottled waters.
13. Microorganisms in cereals and bakery products, sugars, candies.
14. Microorganisms in spices, oil rich seeds, coffee, tea, herbs. Microorganisms in cans and RDE, RDU products.

**Évközi ellenőrzés módja:** a gyakorlatokon való részvétel kötelező. A gyakorlatok 70%-án való részvétel kötelező. A gyakorlatokhoz kapcsolódóan jegyzőkönyvet kell leadni a hallgatónak. Az aláírás megszerzésnek feltétele a gyakorlatokon való részvétel.



**Számonkérés módja** *(félévi vizsgajegy kialakításának módja – beszámoló, gyakorlati jegy, kollokvium, szigorlat):* gyakorlati jegy

**Oktatási segédanyagok:** az előadások diasorai

**Ajánlott irodalom:**

Jay, J. M., Loessner, M. J., Golden, D. A. (2005): Modern Food Microbiology. ISBN 978-0-387-23413-7

Adams, M. R., Moss M. O. (2008): Food Microbiology. The Royal Society of Chemistry. ISBN 978-0-85404-284-5

Karaffa E., Peles F (2014): Microbiological Aspects of Food Quality And Safety. Debreceni Egyetem, Debrecen.

Madigan, M. T, Martinko, J. M., Bender K., Buckley, D., Stahl, D (2015): Brock Biology of Microorganisms, Benjamin Cumming, 14th edition 1030 oldal, ISBN 978-1-292-01831-7

## **REQUIREMENTS**

### **2018/19 academic year II. semester**

**Name and code of the subject:** Minőségirányítás, minőségmenedzsment (Quality Control, Quality Management) MTMEL7012A

**Name and title of the person responsible for the subject:** Tünde Pusztahelyi, PhD,  
Associate Professor

**Additional instructors involved in teaching the subject:** Diána Ungai, Ph.D.

**Name and level of the program:** Élelmiszerbiztonsági és –minőségi mérnöki (Food Safety and Quality Engineering) MSc

**Subject type:** kötelező (compulsory)

**Teaching timetable of the subject, type of examination:** 2+1 K

**Credit value of the subject:** 4

#### **Purpose of teaching the subject:**

The course covers the concept and importance of quality, the historical background, the concept of quality assurance. Development of quality management, evolvement of total quality management from the quality checking of the manufactures. Quality tools and techniques are also discussed and are the main topics of the practice. LEAN as main goal and practice with its tools in industry is also presented. Audit of the quality control systems and the accreditation techniques as well as quality assurance in laboratory are covered.

#### **Content of the subject (14 weeks):**

1. Legal aspects of quality management. Warranty, product liability, certification of product safety, compliance. Contracts.
2. The concept of quality, process elements of quality, external and internal factors of quality. Crosby's quality absolutes. Juran's quality planning pathway.
3. Edward Deming's philosophy. Quality management plan (PDCA cycle)
4. Economic aspects of quality management. Cost of quality (Feigenbaum), Process-cost. Quality controlling.
5. The Japanese philosophy: kaizen. KAIZEN tools.
6. Total quality management. Kaizen in TQM in ISO 9000.
7. Process-orientation and process control
8. Standardization, system management standards. Elements of quality management.
9. Project-management.
10. LEAN. LEAN tools: six sigmas, DMAIC, value stream mapping
11. Good Laboratory Practice
12. Accreditation techniques.
13. Metrology. Measurement and control of measurement by the ISO 9000 standards.
14. Calibration and validation. Characteristics and formality of quality assurance of analytics.

#### **Practical:**

1. Root cause analysis -5 Why method, Flowcharting
2. Root cause analysis – Fishbone diagram
3. Root cause analysis – Affinity diagram
4. Check sheet
5. Histogram
6. Pareto diagram and ABC diagram
7. Gantt diagram
8. Scatter plot

9. Control charts
10. Force field analysis
11. Break-even analysis
12. Matrix of competence
13. FMEA
14. 5S method and self-test

**Type of mid-term examination:**

Condition for obtaining a signature are participating in the practical classes and submitting the assignments.

**Method of assessment (semester examination mark - report, practical grade, colloquium, examination):** colloquium

**Teaching aids:** Pusztahelyi: Practical Exercises for the “Course Quality Control, Quality Management” (MTMEL7012A)

**Recommended literature:**

Peles, Juhász: Quality assurance.

Pojasek: Lean, Six Sigma, and the Systems Approach: Management Initiatives for Process Improvement Environmental Quality Management, 13 (2), 2003.

Soković et al.: Basic Quality Tools in Continuous Improvement Process Journal of Mechanical Engineering 55, 5(2009)

## **REQUIREMENTS**

### **2018/2019. academic year II. semester**

**Name and code of the subject:** Élelmiszerminőségi és biztonsági kockázatelemzés (Food quality and safety risk analysis), MTMEL7021A

**Name and title of the person responsible for the subject:** Dr. Nikolett Czipa, associate professor

**Additional instructors involved in teaching the subject:** Loránd Alexa, PhD student; Andrea Kántor, PhD student

**Name and level of the program:** Food Safety and Quality Engineering MSc

**Subject type:** compulsory

**Teaching timetable of the subject, type of examination:** 3+2, examination

**Credit value of the subject:** 5

**Purpose of teaching the subject:** The main aim of the lectures is to know the physical, chemical and biological/microbiological hazards which are important effect to the food safety and food quality. The student will know the different foodborne diseases that are caused by different bacteria and parasites. In this semester the student will know the methodology of risk analysis (mainly the risk assessment) and the methodology of determination of tolerable intakes and other toxicological values.

#### **Content of the subject (14 weeks):**

1. Introduction to food safety
2. Influencing factors of food chain safety
3. Chemical hazards
4. Microbiological hazards
5. Vulnerable groups, foodborne diseases
6. Introduction to toxicology, dose-response analysis, determination of safe human dose
7. Human exposure assessment
8. Introduction to risk analysis
9. Risk management and risk communication
10. Risk assessment
11. Chemical risk assessment
12. Introduction to biotechnology, risks of genetically modified plants
13. Risk assessment of genetically modified foods
14. Risk ranking

**Type of mid-term examination:** Attendance in the case of practical courses is compulsory. The acceptable extent of absences is 2 practical courses / semester.

Criterion of signature: Active attendance on the practical courses and presentation of an individual project task

**Method of assessment (semester examination mark - report, practical grade, colloquium, examination):** examination

**Teaching aids:** Slides of lectures

**Recommended literature:**

WHO (2000): Human Exposure Assessment (Environmental Health Criteria; 214). Geneva, Switzerland

WHO (2010): WHO Human Health Risk Assessment Toolkit: Chemical Hazards. Geneva, Switzerland

Tulve et al. (2016): Guidelines for Human Exposure Assessment. U.S. EPA

**REQUIREMENTS**  
**2018/19. academic year 2<sup>nd</sup> semester**

**Name and code of the subject: Packaging technology, MTMEL7030A**

**Name and title of the person responsible for the subject: Prof. Dr. Béla Kovács, professor**

**Additional instructors involved in teaching the subject: Éva Bacskiné Dr. Bódi**

**Name and level of the program: Food Safety and Quality Engineering MSc, 1.**

**Teaching timetable of the subject, type of examination: 2+0, exam**

**Credit value of the subject: 3**

**Purpose of teaching the subject:**

The types of packaging materials (textiles, wood, metal, glass, paper and plastic), pairing possibilities knowledge. The quality of the packaging and reliability. Packaging machines and devices. packaging environmental impact of materials, re-processability. Food and packaging interaction (diffusion and migration). The food commodity marking (labeling). Mandatory and voluntary labeling (use of information and advertising).

**Content of the subject (14 weeks):**

1. Packing elements (basic concepts, aims and tasks of the pack)
2. Packaging Training (consumer and multipack packaging)
3. Paper (sachets, bags, sacks, carton boxes)
4. Metal packaging products (coated and zinc plated steel plate, aluminum foil, trays, tubes and barrels)
5. plastics-based packaging products (hermoplastics and hardening plastics films, plates, boxes, hollow objects)
6. Glass containers (narrow and wide-mouth jars and closing their methods)
7. Wood packing materials
8. Textiles packing materials
9. Combined packaging supplies
10. Vacuum and modified atmosphere packaging
11. Dangerous goods packaging
12. Cargo handling markings, signs
13. Packaging and the environment protection
14. The food and packaging materials interaction

**Type of mid-term examination:**

Assignments to be submitted

**Method of assessment (semester examination mark - report, practical grade, colloquium, examination):**

70 % attendance and fulfilment of the tasks is compulsory for the signature. Final grad is deduced from results of mid-term accomplishments and the results of the final exam.

**Teaching aids:**

To be find in e-learning

**Recommended literature:**

Richard Coles, Derek McDowell, Mark J. Kirwan: 2003. Food packaging technology. CRC Press, London. 346 p. ISBN 9780849397882.

Dong Sun Lee, Kit L. Yam, Luciano Piergiovanni: 2008. Food Packaging Science and Technology. CRC Press, London. 656 p. ISBN 9780824727796.

Gordon L Robertson: 2013. Food Packaging Principles and Practice. CRC Press, London. 686 p. ISBN 9781439862421.