

REQUIREMENTS

2021/2022 academic year I. semester

Name and code of the subject: General and inorganic chemistry (MTB7006A)

Name and title of the person responsible for the subject: Dr. Vágó Imre, associate professor

Additional instructors involved in teaching the subject: Kincses Sándorné Dr, assistant professor; Erdeiné Dr. Kremper Rita, assistant professor; Dr. Béni Áron assistant professor

Name and level of the program: Food Engineering BSc

Subject type: obligatory

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

Credit value of the subject: 4

Purpose of teaching the subject: Learning the basics of "General and inorganic Chemistry" for related subjects

Content of the subject (14 weeks):

Week 1-2: Material and structure. Material systems. Parts of the atom. The structure of the nucleus. Atomic models. X-rays. Quantum numbers, orbital energy, nuclear orbital charge, Pauli principle and Hund rule. Periodic Table. Nuclear trunk, valence shell. Ionization energy, electron affinity, electronegativity. Size of atoms and ions and their change in the periodic table.

Week 3-4: Structure of molecules. Primary chemical bonds, binding and loosening molecular pathways. Sigma and pi binding. Hybridization. Secondary chemical binding forces. Geometry and polarity of molecules. Order of binding. Complexes, chelates. Clathrates; detection of starch in foodstuffs.

Week 5: Complex material systems. Material sets. Solid state. Crystal lattice types. Solutions, solubility. Heat of hydration, heat of dissolution. Liquid and gaseous state, gas laws.

Week 6: Mixtures, solutions, electrolytes. Ways of expressing the concentration of solutions. Dilute solutions and their properties.

Week 7: Reaction kinetics. Direction of chemical processes, time course, factors influencing reaction rate. Catalysis, catalysts.

Week 8-9: Protolytic processes. Major acid-base theories. Law of mass effect. Dissociation of weak acids and bases. The concept and interpretation of pH. Hydrolysis of salts. Indicators, buffers. Solubility product of salts. Stability of complex ions.

Week 10: Electrochemistry. Oxidation number. Electrolysis, Faraday's laws. Electrode, normal and standard potential. Hydrogen electrode. Galvanic cells. Redox systems, redox potential. Local elements.

Week 11: Colloids. Colloidal systems, specific surface area of colloids. Properties of colloidal solutions, adsorption. Stability of colloids. Gels.

Inorganic chemistry

Week 12: Distribution of elements by frequency and property. Non-metallic elements: Hydrogen. Halogen elements and their compounds. Oxygen group elements. Sulfur and its compounds. Nitrogen group elements. Nitrogen and its compounds.

Week 13: Phosphorus and its compounds. Elements of a carbon group. Carbon and inorganic compounds. Silicates. Boron and its compounds.

Week 14: Metallic elements: Alkali metals, alkaline earth metals and their compounds. Water hardness, water softening. Natural waters. Properties and compounds of aluminum. Elements and major compounds of the zinc group. Elements and major compounds of the manganese group.

Type of mid-term examination: Report on laboratory exercises

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

Teaching aids: ppt

Recommended literature:

P. Atkins, L. Jones, L. Laverman (2016) "Chemical Principles: The Quest for Insight". 7th edition.
Publisher W.H. Freeman and Company. ISBN 1464183953

REQUIREMENTS

2021/2022. tanév I. félév

A tantárgy neve, kódja: Informatika (Informatics), MTB7008A

A tantárgyfelelős neve, beosztása: Dr. Várallyai László, egyetemi docens

A tantárgy oktatásába bevont további oktatók:

Szak neve, szintje: Élelmiszermérnöki BSc angol nyelven

Tantárgy típusa: kötelező

A tantárgy oktatási időterve, vizsga típusa: 0+2 G

A tantárgy kredit értéke: 3

A tárgy oktatásának célja: The course is designed to reach a basic level of business informatics knowledge. These knowledge will help them in the following courses and as well as in the practice. They have to learn how to collect data from the internet, and they have to solve complex exercises with the use of Office program family. The course is mainly application and practice oriented.

A tantárgy tartalma (14 hét bontásban):

1. The use of spreadsheet: basic, formatting, data format
2. The use of spreadsheet: links, (SUM, COUNT, MIN, MAX, AVERAGE)
3. The use of spreadsheet: logical operators (IF, AND, OR); Search functions (VLOOKUP, INDEX, MATCH).
4. The use of spreadsheet: Matrix functions.
5. The use of spreadsheet: Pivot tables
6. Database : Creation of relation tables, the role of keys.
7. Database creation, sheet, form creation.
8. Database queries (QBE, SQL).
9. Database creation (action-oriented)
10. Database forms and subforms creation
11. Database report creation.
12. Independent practical problem solving, task presentation I.
13. Independent practical problem solving, task presentation II.
14. Independent practical problem solving, task presentation II..

Évközi ellenőrzés módja: The students get theoretical basic knowledge on the practices. The students get presentations on the practices get spreadsheets and database knowledge tasks.

Számonkérés módja *(félévi vizsgajegy kialakításának módja – beszámoló, gyakorlati jegy, kollokvium, szigorlat):* Participation at practices is mandatory. For the completion of the semester students have to pass a problem solving practical test during the semester.

50% Excel practical exam, 50% Database practical exam

The sum of points the notes are the followings:

- 0 - 60 % fail,
- 61 -70 % pass,
- 71 -80 % satisfactory,
- 81 -90 % good,
- 91 – 100 % excellent.

Oktatási segédanyagok: practical tasks

Ajánlott irodalom:

R. Elmasri: Fundamentals of Database Systems, Pearson, 2016, ISBN: 9781292097619, pp. 1272

Ullman, J.D., Widom J.: Adatbázisrendszerek, Alapvetés, Panem Kft., 2009, 9789635454815, pp. 600.

Date, J. C.: An Introduction to Database Systems, Pearson, 2003, ISBN13 (EAN): 9780321197849, pp. 1024.

REQUIREMENTS

2021/22 academic year I. semester

Name and code of the subject: Gazdaságtudományi ismeretek I. (EU ismeretek, agrárgazdaságtan) MTB7020A

Name and title of the person responsible for the subject: Dr. Szenderák János (25%), Dr. Fróna Dániel (25%)

Additional instructors involved in teaching the subject:

Name and level of the program: élelmiszer-mérnök BSc (angol nyelven)

Subject type: mandatory

Teaching timetable of the subject, type of examination:

Teaching timetable

1. Global issues and agriculture
2. The role of the agribusiness in the national economy
3. Resources of the agriculture I.
4. Resources of the agriculture II.
5. Sustainable agriculture I.
6. Sustainable agriculture II.
7. Agriculture and climate change
8. EU history
9. Institutions of the EU
10. Economic and Monetary Union, EU budget
11. Common Agricultural Policy I.
12. Common Agricultural Policy II.
13. Rural development policy
14. Energy policy

The type of examination is written exam.

Credit value of the subject: 4

Purpose of teaching the subject:

The aim of the course is to study the role of agriculture in the national economy and special attention will be placed on sustainable development and environmental pressure. Sustainable development has been a central topic in economic sciences, thus the subject focuses on sustainability issues, especially on climate change. The second half of the semester is devoted to EU studies. Students learn about the history, functioning and main institutions of the EU. Particular attention will be paid to the Common Agricultural Policy (CAP) and energy policy.

Content of the subject (14 weeks):

1. Global issues and agriculture: *How does agriculture affect the environment?*
2. The role of the agribusiness in the national economy : *Why is agriculture important in terms of economic development?*
3. Resources of the agriculture I.: *What is the bio capacity of the Earth?*
4. Resources of the agriculture II.: *What is the bio capacity of the Earth?*
5. Sustainable agriculture I.: *How can we make agriculture more sustainable?*
6. Sustainable agriculture II.: *How can we make agriculture more sustainable?*
7. Agriculture and climate change: *What is the contribution of agriculture to global warming?*
8. EU history: *The milestones of the EU history, main historical events that shaped its development.*
9. Institutions of the EU: *Main institutions and their function in the EU.*
10. Economic and Monetary Union, EU budget: *The common budget and its aim.*

11. Common Agricultural Policy I.: *The history of the CAP.*
12. Common Agricultural Policy II.: *The main role of the CAP.*
13. Rural development policy: *What are the main rural development issues in the EU?*
14. Energy policy: *The main energy policy developments and issues.*

Type of mid-term examination:

No mid-term examination is involved.

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

Students' performance will be evaluated based on a written exam in the exam period.

Teaching aids:

Lecture slides and short videos presented occasionally to facilitate the understanding of the subject.

Recommended literature:

- Scientific articles distributed on a weekly basis (depending on the topic)
- The Intergovernmental Panel on Climate Change reports related to agriculture
- The European Commission official documents and reports

REQUIREMENTS

2021/22 academic year, 1st semester

Name and code of the subject: Molecular cell biology, MTBE7001A

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 engineering BSc

Subject type: compulsory;

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

Credit value of the subject: 4

Purpose of teaching the subject:

System biology type of interpretation of the molecular and cellular organization levels of living matter and life phenomena. Structural and functional features of pro- and eukaryotic cells. Genome structure and expression of genetic information. The cell cycle and its regulation. Presentation of molecular relationships related to cell structure and function and the most important molecular research methods.

Content of the subject (14 weeks):

LECTURES:

Course objectives:

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

4-5. Eukaryotic compartments, cellular organelles and homeostasis.

6-8. Cell nucleus, nucleolus, chromosomes. Gene expression. DNA replication and repair. Nuclear transport.

9-10. Cytoskeleton: actin, intermediate filaments, microtubules, centrosomes, mitotic spindle.

11-12. Mitochondria. Regulation of cellular metabolism: glycolysis, Krebs cycle, ETC, beta-oxidation, ATP synthesis.

13-14. Spatial and temporal regulation of cellular events, the cell cycle.

PRACTICALS:

1-2. Microscopic analysis of chromosomes.

3-5. Molecular investigation methods. Genomic and plasmid DNA isolation. PCR techniques.

6-8. Molecular cloning and analysis of transgenic organisms.

9-11. Immunofluorescence analysis of eukaryotic cell related structures.

12-14. *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

2021/22 academic year I. semester

Name and code of the subject: Organic chemistry (MTBE7002A)

Name and title of the person responsible for the subject: Erdeiné Dr Kremper Rita, assistant professor

Additional instructors involved in teaching the subject: -

Name and level of the program: Food Engineering BSc

Subject type: obligatory

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

Credit value of the subject: 3

Purpose of teaching the subject:

This course gives basic knowledge for the subsequent biochemistry and food chemistry subjects.

Content of the subject (14 weeks):

Week 1: C-hybrid states. Classification of organic compounds by carbon skeleton and functional groups. Bond line drawing.

Week 2: Intermolecular forces, polarity, physical properties of organic molecules

Week 3: Hydrocarbons. Major types of organic chemical reactions (substitution, addition, polymerization). Dienes, polyenes (terpenes). The chemical properties of terpenes.

Week 4: Benzene, aromatic compounds,

Week 5: Alcohols.. ethers, thiols,

Week 6: Aldehydes , ketones

Week 7: Carboxylic acids and their derivatives

Week 8: Carbohydrates, monosaccharides,

Week 9: Carbohydrates, disaccharides, oligosaccharides and polysaccharides

Week 10. Amino acids, peptides and proteins

Week 11: Lipids I , hydrolysable lipids

Week 12: LipidsII. Non hydrolysable lipids

Week 13: Pyridine and pyrimidine and their derivatives. Purine and its derivatives. Lactim-lactam tautomerism. Structure of nucleosides and nucleotides

Week 14: Primary structure, secondary structure of nucleic acids. Relationship between the structure and biological function of nucleic acids.

Type of mid-term examination: 12 assignments, 5 tests

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

The summarized results of the midterm tests give the final results. The assignments are also taken into account. Based on these results a grade is offered for the students. If they do not accept it, they can take a written or oral exam in the exam session. If someone fail to submit 66% of the assignments the subject is not accepted for him.

Teaching aids:

Recommended literature:

1. Frederick A. Bettelheim, Mary K. Campbell, Shawn O. Farrell, William H. Brow
Introduction to General, Organic and Biochemistry ISBN-13-9780495110699

1. T. W. Graham Solomons, Craig B. Fryhle Scott A. Snyder Organic chemistry ISBN-13: 978-1118133576
2. David R, Klein Organic chemistry as a second language 2004, John Wiley and Sons Inc, ISBN 0-471-27235-3

REQUIREMENTS

2021/2022. academic year I. semester

Name and code of the subject: Élelmiszerbiztonság alapjai (Introduction to food safety), MTBE7004A

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

Additional instructors involved in teaching the subject: Loránd Alexa, assistant lecturer

Name and level of the program: Food Engineering BSc

Subject type: compulsory

Teaching timetable of the subject, type of examination: 2+0, practical course mark

Credit value of the subject: 3

Purpose of teaching the subject: The main aim of this course is to know the organisations, regulations and requirements which aim the production of safe food. Student will know the methodology of hazard analysis and risk assessment of chemical and microbiological hazards.

Content of the subject (14 weeks):

1. Regulations for food quality and food safety
2. European food safety policy, ÉLBS
3. Influencing factors of food quality and food safety
4. Biological and microbiological hazards in foods
5. Chemical hazards (heavy metals, arsenic, mycotoxins)
6. Chemical hazards (plant and animal toxins)
7. Vulnerable groups
8. Introduction to toxicology, influencing factors of toxicity
9. Determination of safe human dose, human exposure assessment
10. Chemical risk assessment
11. Labelling of food
12. Geographical indicators and trade marks
13. Authorization of food business
14. RASFF and INFOSAN

Type of mid-term examination: The Students have three 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.

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

Teaching aids: Slides of lectures

Recommended literature:

Nikolett Czipa (2017): Practical exercises for the course of introduction to food safety. Dbreceni Egyetem
Regulations

REQUIREMENTS

2021/2022 academic year I. semester

Name and code of the subject: Basics of quality management. MTBE7010A

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 engineering BSc

Subject type: obligatory

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

Credit value of the subject: 3

Purpose of teaching the subject: The aim of the subject is the introduction of the basic concepts and characteristics of quality and quality management, furthermore the basics of the quality and environmental management systems and related standards.

Content of the subject (14 weeks):

1. Concept and importance of quality
2. History of quality development
3. Quality assurance professionals
4. Process of meeting the market demands
5. Quality regulating system
6. Good practices
7. Basics of GLOBALGAP
8. Basics of HACCP
9. Basics of quality management system
10. Basics of environmental management system
11. Integrated management systems
12. Basics of TQM
13. Quality awards
14. Quality tools and techniques

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

2021/2022 academic year I. semester

Name and code of the subject: Food colloids, MTBE7012A

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

Additional instructors involved in teaching the subject: -

Name and level of the program: Food Engineering BSc, 2

Subject type: Main subjects

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

Credit value of the subject: 3

Purpose of teaching the subject:

Historical overview. Classifications of colloidal systems. General characterization of colloidal systems. General descriptions of the most important laws. Food colloid systems.

Content of the subject (14 weeks):

- Lecture 1: The science of colloid, historical overview, the concept of the colloidal state, the grouping of material systems.
- Lecture 2: Classifications of colloidal systems, grouping on the basis of the dispersed nature and the interactions between the particles.
- Lecture 3: 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.
- Lecture 4: Aero disperse systems, liquid medium disperse systems, gas dispersions, foams.
- Lecture 5: Suspensions, emulsions, solid medium disperse systems, macromolecular colloidal solutions, association colloids.
- Lecture 6: Coherent systems, gels, liquid medium concentrated disperse systems
- Lecture 7: Dry powder agglomerations, solid foams, solid macromolecules, kinetic regularities
- Lecture 8: General descriptions of the most important laws. Brownian motion, diffusion, osmosis, sedimentation, stability of disperse systems.
- Lecture 9: Coagulation, stability and coagulation of suspensions, stability of foams, status changes of gels. Rheological properties, rheological basic concepts, deformations, elastic deformations, flows.
- Lecture 10: The concepts of strength and consistency, behaviour of non-Newtonian liquids, rheology of colloidal systems, viscosity of disperse systems, flow of suspensions.
- Lecture 11: Viscosity of solutions of yarn shaped polymer molecules, viscosity of emulsions, and structural viscosity of disperse systems, main food colloidal systems, and food suspensions.
- Lecture 12: Food emulsions, food gels.
- Lecture 13: Protein gels, polysaccharide gels, food foams.
- Lecture 14: 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): Colloquium

Teaching aids: Powerpoint

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

2021/2022. tanév I. félév

A tantárgy neve, kódja: Unit operations in food processing I., MTBE7013A

A tantárgyfelelős neve, beosztása: Prof. Dr. Kovács Béla – egyetemi tanár

Szak neve: Élelmiszermérnök BSc

Tantárgy típusa: kötelező

A tantárgy oktatási időterve, vizsga típusa: 3. félév (2+2), kollokvium

A tantárgy kredit értéke: 5

A tárgy oktatásának a célja:

Within the framework of Unit operations in food processing the flow of fluids, separation, homogenization and transport processes are educated. In the lectures mathematical description, equipment and conditions of the flow of fluids, separation processes, homogenization processes and transport (solid agglomerations) processes operations are discussed.

A tantárgy tartalma (14 hét bontásban):

1. General description of the flow of fluids
2. Reynolds number, equivalent pipe diameter, principle of continuity
3. Bernoulli equation
4. Fluid transport (pumps, fans, compressors)
5. General description of the mechanical separations, gravity sedimentation
6. Centrifugal sedimentation, types of centrifuges, cyclones, hydrocyclones
7. Filtration, filtering equipments
8. Pressing, pressing machines
9. Homogenization, mixing, mixers
10. Emulsification, emulsifying equipments
11. Crushing, crushers
12. Pounding, pounding machines
13. Fluidization
14. Pneumatic transport

Évközi ellenőrzés módja *(a foglalkozásokon való részvétel előírásai és félévközi ellenőrzésének módja, a vizsgára bocsátás és aláírás feltételei):*

During the semester, the students may write theoretical 3 tests, based on which they may get an offered mark for the exam. In addition, students have to write 3 tests to the topics of the practice (seminar), and they will get the mark for the practice (seminar) based on these tests.

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

Oktatási segédanyagok:

ppt presentation, books

Ajánlott szakirodalom:

Food Process Engineering and Technology. 2nd Edition. Authors: Zeki Berk. Hardcover ISBN: 9780124159235. eBook ISBN: 9780124159860

Unit Operations in Food Processing, Second Edition 2nd Edition by R.L.Earle eBook ISBN: 9781483293103

Introduction to Food Engineering, Fifth Edition (Food Science and Technology) 5th Edition by R Paul Singh (Author), Dennis R. Heldman (Author) ISBN-13: 978-0123985309

Fundamentals of Food Process Engineering (Food Science Text Series) 4th ed. 2018 Edition by Romeo T. Toledo (Author), Rakesh K. Singh (Author), Fanbin Kong (Author), ISBN 978-3-319-90091-1

REQUIREMENTS

2021/22. tanév I. félév

A tantárgy neve, kódja: Mikrobiológia alapjai, MBTE7016

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

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

Szak neve, szintje: Élelmiszermérnöki BSc

Tantárgy típusa: kötelező

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

A tantárgy kredit értéke: 3

A tárgy oktatásának célja:

Within the course, students will learn about the structure, metabolism, and genetics of microbial cells. The evolution of microbes, the prokaryotes and the main phylogenetic groups of eukaryotic microbes and their characteristics are described. We present the ecological, environmental, food, biotechnological role of microbes, plant, animal and human diseases.

A tantárgy tartalma (14 hét bontásban):

1. Microorganisms and Microbiology
2. Brief History of Microbiology
3. Cell Chemistry
4. Metabolism
5. Microbial Growth
6. Environmental effects of microbial growth
7. Molecular Biology of Microorganisms – Genes and Replication
8. Molecular Biology of Microorganisms –Transcription
9. Molecular Biology of Microorganisms – Translation
10. Protein synthesis
11. Microbial Evolution and systematics
12. Taxonomy of the Prokaryotes
13. Taxonomy of the Eukaryotes
14. Viruses

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):* kollokvium

Oktatási segédanyagok: az előadások diásorai

Ajánlott irodalom:

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

Hogg S (2005): Essential Microbiology, John Wiley & Sons Ltd, 481 oldal, ISBN 0 471 49753 3

Talaro, K. P. (2015): Foundations in microbiology, Pasadena City College, Barry Chess, Pasadena City College. – Ninth edition. 929 oldal, ISBN 978-0-07-352260-9 Deák Tibor,

REQUIREMENTS

2021/2022. academic year I. semester

Name and code of the subject: Élelmiszer analitika (Food analytics), MTBE7023A

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

Additional instructors involved in teaching the subject: Loránd Alexa, assistant lecturer

Name and level of the program: Food Engineering BSc

Subject type: compulsory

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

Credit value of the subject: 4

Purpose of teaching the subject: The main aim of the lectures is to know the classic analytical methodologies and their theoretical background. The students get knowledge about different methods which are suitable for the determination of physicochemical parameters of food.

Content of the subject (14 weeks):

1. Food ingredients; Sampling and sample preparation
2. Determination of moisture content, ash content and electrical conductivity
3. Determination of lipids
4. Determination of proteins
5. Determination of carbohydrates
6. Determination of fibre content
7. Determination of vitamin
8. Determination of enzyme
9. Determination of antioxidant
10. Determination of amino acid
11. Determination of acid content and acidity
12. Determination of alcoholic beverages' nutritional parameter
13. Sensory analysis
14. Calculation of nutritional value calculation

Type of mid-term examination: Attendance in the case of practical courses is compulsory. The acceptable extent of absences is 3 practical courses / semester.

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): Food analytics. Practical exercises for the course of food analytics.

Debreceni Egyetem

János Csapó, Éva Visi Vargáné (2011): Introduction to the Chemistry of Foods and Forages.

Digitális tankönyvtár

Bogdanov, S. (2002). Harmonised Methods of the International Honey Commission. Swiss Bee Research Centre. FAM, Liebefeld, CH-3003 Bern, Switzerland

Codex Alimentarius; Directives

REQUIREMENTS

2021/2022 academic year I. semester

Name and code of the subject: Food microbiology. MTBE7024A

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 engineering BSc

Subject type: obligatory

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

Credit value of the subject: 4

Purpose of teaching the subject: The aim of the subject is the introduction of the subject, task and history of food microbiology, internal and external factors that influence the safety and quality of raw materials and finished products. Students will also learn about the most important microbiological contaminants of the food, the major preservation methods, furthermore the disease and spoilage causing microorganisms.

Content of the subject (14 weeks):

1. The subject, task and history of food microbiology
2. Microbial ecology of food. Sources of contamination
3. Characteristics of microorganisms. The inherent characteristics of food
4. External environmental factors. Interactions of ecological factors
5. Growth and destruction of microorganisms
6. Diseases caused by food (food infection, food poisoning)
7. Food borne pathogens
8. Mycotoxin-producing moulds, mycotoxins
9. Preserving operations. Heat treatment, heat removal, dehydration, radiation
10. Chemical and combined preservation methods
11. Food-fermentation. Useful microorganisms
12. Indicator and spoilage microorganisms
13. Microbiology of plant products
14. Microbiology of animal products

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

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

Teaching aids: PPT slides

Recommended literature:

Karaffa, E. – Peles, F. (2015): Microbiological aspects of food quality and safety. University lecture notes. University of Debrecen. TÁMOP-4.1.2.D-12/1/KONV-2012-0008. 110p.

Doyle, M.P. - Buchanan, R.L. (2013): Food Microbiology: Fundamentals and Frontiers. 4th edition. ASM Press, Washington. 1118p.

Adams, M.R. - Moss, M.O. (2008): Food Microbiology. 3rd edition. RSC Publishing. 478p.

REQUIREMENTS

2020/2021. tanév I. félév

A tantárgy neve, kódja: Dairy industry technology, MTBE7027A

A tantárgyfelelős neve, beosztása: Fekete István – egyetemi tanársegéd

Szak neve: Élelmiszermérnök BSc

Tantárgy típusa: kötelező

A tantárgy oktatási időterve, vizsga típusa: 5. félév (1+0), kollokvium

A tantárgy kredit értéke: 3

A tárgy oktatásának a célja:

Aim of education of course to provide the necessary theoretic information on the dairy industry, production and preservation of dairy products including technology issues.

A tantárgy tartalma (14 hét bontásban):

1. Primary production of milk, milking technology on the farm, chilling milk on the farm
2. The composition of milk, health Benefits of Dairy products
3. Collection and reception of milk, testing milk for quality
4. Raw-milk storage, General milk treatment (pasteurization)
5. General milk treatment (clarification and cream separation, homogenization)
6. Processing of pasteurised market milk
7. Processing of cultured-milk products
8. Buttermaking
9. Cheese production (Regulations of producing cheese, definitions, physical-, chemical- and sensory properties of the cheese, nutritional role of cheese, materials of production)
10. Cheese production (Making of 'Trappista', a special semi-hard cheese, and making of Camembert cheese)
11. Production of fresh cheese (cottage cheese, quark), Production of processed cheese
12. Usage of the dairy industry by-products
13. Production milk powder, and condensed milk
14. Production of ice-cream

Évközi ellenőrzés módja *(a foglalkozásokon való részvétel előírásai és félévközi ellenőrzésének módja, a vizsgára bocsátás és aláírás feltételei):*

During the exam period, a one-hour written exam in which students answer five to six comprehensive questions.

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

Oktatási segédanyagok:

előadásanyagok (ppt prezentáció), tankönyvek

Ajánlott szakirodalom:

Chandan, R.C., Kilara, A., Shah, N.P. (2018): Dairy Processing and Quality Assurance. 2008 & 2016 by John Wiley & Sons Ltd. p.663

Teknotext AB (1995). Dairy processing handbook. Tetra Pak Processing Systems AB. S-221 86 Lund, Sweden. p.442

Datta, N., Tomasula, P.M. (2015): Emerging Dairy Processing Technologies: Opportunities for the Dairy Industry 2015 by John Wiley & Sons, Ltd. p.362

REQUIREMENTS

2021-2022 academic 1st year 2nd semester

Name and code of the subject: Nutritional genetics and genomics

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 BSc, MSc

Subject type: szabadon választható ; 2 lect. + 2 pract.

Teaching timetable of the subject, type of examination: 2nd semester, oral

Credit value of the subject: 3

Purpose of teaching the subject:

Students will understand 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:

- 1-2. Nutritional genetics and genomics. Concepts, research tools and expectations.
- 3-4. Epigenetics. Molecular targets for diet and chronic disease prevention. Diet influenced chromatin modifications and expression of chemopreventive genes.
- 5-6. Natural antioxidants and cellular mechanism of action.
- 7-8. Carbohydrate metabolism and its genetic control.
- 9-10. Nutrition and inflammatory response.
- 11-12. Genes, nutrition and metabolic syndrome.
- 13-14. Genes, nutrition and cancer.

PRACTICALS:

- 1-2. *Drosophila melanogaster* as a nutritional genetic research model system.
- 3-4. Studying plant extracts induced chromatin organization modifier effects
- 5-6. Evaluation of mutagenic effect using somatic mutation and recombination test.
- 7-8. Evaluation of Keap1/Nrf2/ARE mediated xenobiotic response induced by plant extracts.
- 9-10. Animal models for studying the metabolic syndrome.

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:

- Aggarwal, B.B., Heber, D. (2014). Immunonutrition: Interactions of Diet, Genetics, and Inflammation. CRC Press, ISBN: 9781466503854.

- Bidlack, WR, Rodriguez, RL. (2012). Nutritional Genomics. The impact of dietary regulation of gene function on human disease. CRC Press, Taylor & Francis Group, Boca Raton, London, New York, ISBN: 978-1-4398-4452-6.
- Brigelius-Flohé R and Joost H-G. (2006). Nutritional Genomics. Impact on Health and Disease. Wiley-VCH Verlag GmbH&Co. KGaA. ISBN-10: 3-527-31294-3
- Fonyó, A. (2012). Élettan gyógyszerészhallgatók részére. Medicina Könyvkiadó Zrt. ISBN 978 963 226 393 9
- Graham, G., Kesten, D., Scherwitz, L. (2011). Pottenger's Prophecy: How Food Resets Genes for Wellness or Illness. ISBN: 978-1-935052.
- Kohlmeier, M. (2012). Nutrigenetics Applying the Science of Personal Nutrition. Academic Press. ISBN: 978-0-12-385900-6
- Lanham-New, S.A., Macdonald, I.A., Roche, H.M. (2010). Nutrition and Metabolism, 2nd Edition. Wiley-Blackwell. ISBN: 978-1-4051-6808-3
- Shanahan, C. and Shanahan, L. (2008). Deep Nutrition: Why Your Genes Need Traditional Food. ISBN-10: 0-615-22838-0.
- PUBMED database /Books:
 - Pagon RA, Adam MP, Ardinger HH, et al., editors. (1993-2014). GeneReviews® [Internet]. Seattle (WA): University of Washington, Seattle; 1993-2014.
 - Making Sense of Your Genes: A Guide to Genetic Counselling. National Society of Genetic Counselors; Genetic Alliance. Washington (DC): Genetic Alliance; 2008.
 - Integrating Large-Scale Genomic Information into Clinical Practice: Workshop Summary. Institute of Medicine (US). Washington (DC): National Academies Press (US); 2012.
 - Benzie I.F.F. and Wachtel-Galor, S. (2011). Herbal Medicine, 2nd edition. CRC Press; ISBN-13: 978-1-4398-0713-2