REQUIREMENTS
2017/2018. academic year II. semester

Name and code of the subject: Sustainable agriculture systems Crop production I, MTMKG7004A
Name and title of the person responsible for the subject: Dr. József Csajbók associate professor
Additional instructors involved in teaching the subject:
Name and level of the program: Environmental Management and Agricultural Engineering, MSc
Subject type: compulsory
Teaching timetable of the subject, type of examination: 2+1 C
Credit value of the subject: 3

Purpose of teaching the subject:

Content of the subject (14 weeks):

1 General fundamentals of field crop production I
2 General fundamentals of field crop production II
3 General fundamentals of field crop production III
4 General fundamentals of field crop production IV
5 Wheat production I
6 Wheat production II
7 Wheat production III
8 Corn production I
9 Corn production II
10 Corn production III
11 Sunflower production I
12 Sunflower production II
13 Alfalfa production I
14 Alfalfa production II

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:
George Acquaah (2001): Principles of Crop Production. Theory, Techniques, and Technology. Pearson Prentice Hall, Upper Saddle River, New Jersey 07458. ISBN 0-13-114556-8
John H. Martin – Richard P. Waldren – David L. Stamp (2006): Principles of Field Crop Production. Pearson Prentice Hall, Upper Saddle River, New Jersey Columbus, Ohio. ISBN 0-13-025967-5
John L. Havlin – Samuel L. Tisdale – James D. Beaton – Werner L. Nelson (2005): Soil Fertility and Fertilizers. Pearson Prentice Hall, Upper Saddle River, New Jersey. ISBN 0-13-027824-6

REQUIREMENTS
2017/18 academic year II. semester

Name and code of the subject: Natural sciences II - Nature conservation ecology MTMKG7008A
Name and title of the person responsible for the subject: László Kövér, Ph.D. senior lecturer
Additional instructors involved in teaching the subject: -
Name and level of the program: Agricultural Enviromental Management Engeenering, MA
Subject type: compulsory
Teaching timetable of the subject, type of examination: 2+2, written exam
Credit value of the subject: 4

Purpose of teaching the subject:
In this subject, there is a special focus on the development of students' general awareness and correct ecological approach. They will learn and be able to apply in practice the specific system of ecological organizational levels and the ecological relationships of living communities. The introduction of anthropogenic impacts on living communities based on the principle of "think globally, act locally" is particularly important.
The ecological concept of the biotic environment and the levels of ecological organization are also part of the curriculum. In addition to the above, they are familiar with the national system of nature conservation and its most important values.

Content of the subject (14 weeks):

1 The system of biotic environmental factors. Population Ecology. The structure of populations, factors that regulate the population.
2. Regulatory mechanism of population numbers, r and K-type selection. Graduation.
3. Intra- and interspecific interactions.
4. Community Ecology. Structure and change of communities.
5. Food chains, food networks. Material and energy flow in biocenosis.
6. The habitat of living beings. Basics of biogeography. The Pannon biogeographical region.
7. Biodiversity. Types, measurement, protection of biodiversity. Concept of ecological footprint.
8. Concept, purpose, principles and system of symbols of nature protection. Green Days.
9. International regulation of nature conservation.
10. Nature conservation value groups. Geological, aquatic values and protection
11. Protection of their wild plant and animal associations.
12. Area-protected natural values
13. International Conservation Conventions
14. Nature Conservation Regulation in the European Union

Type of mid-term examination: no

Method of assessment (semester examination mark - report, practical grade, colloquium, examination): - Regular visits to lectures. Successful completion of the lectures, the practical examinations and the fulfilment of individual tasks.

Teaching aids:

Recommended literature:

Begon M. , Harper J.L., Townsend C.R. (1996): Ecology- Individuals, Populations and communities, Blackwell Science, ISBN: 0-632-03801-2
Otero C., Bailey C. (2003): Europe's Natural and Cultural Heritage, Friends of the countryside, ISBN: 84-607-9790-2
Voloscuk I. (ed). (1999): The National Parks and Biosphere Reserves in Carpathians-The last nature paradise, ACANAP, Tatranská Lominca, Slovak Republic, ISBN: 80-88680-31-X

REQUIREMENTS
2017/18 academic year II. semester

Name and code of the subject: Environmental impact assessment and environmental modeling, MTMKG7009A
Name and title of the person responsible for the subject: Dr. János Tamás, professor
Additional instructors involved in teaching the subject: Bernadett Gálya, senior lecturer
Name and level of the program: Agricultural Environmental Management MSc
Subject type: compulsory
Teaching timetable of the subject, type of examination: 2+2 K
Credit value of the subject: 4

Purpose of teaching the subject: The aim of the subject is to have the basic concepts of environmental modeling acquainted with students, to give an inspection into the operation practice of models connected to soil-water-air-pollution. Students get acquainted with the major application possibilities regarding the environmental aspects of modeling systems. Students learn the human- and ecotoxicological risk assessment.

Content of the subject (14 weeks): theory/practice

1. Principles of modeling. / Surfer GUI.
2. Importance of environmental risk assessment. / Surfer colour management.
3. Characteristics of soil plant atmosphere system. / Surfer data management.
4. Modeling of the impacts on soil and groundwater effects. / Grid DEM.
5. Modeling of the impacts on surface water effects. / Data importing.
6. Modeling of the impacts on atmosphere effects. / Basic Data statistics.
7. Modeling of the impacts on biomass and landscape effects. / DAT data types.
8. Modeling of the impacts on the human health effects. / Griding methods.
9. Socio-economic consequence of the impacts on the environmental effects. / Grid report evaluation.
10. Preparing of environmental impact studies. / Accurate interpolations.
11. Practical application of pollution transmission models, processing of remediation and monitoring. / IDW, TIN.
12. Remediation of soil, groundwater and surface water. / Global interpolations.
13. Cost-benefit analysis of remediation. / Kriging.
14. Development of simulation and modelling software. / Error propagations.

Type of mid-term examination: -

Active participation in lectures and exercises is a successful fulfillment of the tasks defined by the lecturer.

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

Teaching aids: Presentations of lectures.

Recommended literature:
1. Adolf, E., Teimuraz, D. (2007): Air, Water and Soil Quality Modelling for Risk and Impact Assessment. Springer Verlag. 365 p.

2. Colombo, A. G. (2012): Environmental Impact Assessment. Springer Verlag. 334 p.
3. Bastmeijer, K., Koivurova, T. (2008): Theory and Practice of Transboundary Environmental Impact Assessment. Martinus Nijhoff Publishers. 397 p.
4. Wathern, P. (2013): Environmental Impact Assessment. Theory and Practice. Routledge (Taylor and Francis Group). 352 p.
5. GoldenSoftware (2018) Surfer Manual https://www.goldensoftware.com/products/surfer

REQUIREMENTS
2017/2018. academic year II. semester

Name and code of the subject: Élelmiszerlánc-biztonság (Food chain safety), MTMKG7010A
Name and title of the person responsible for the subject: Dr. Nikolett Czipa, assistant professor
Additional instructors involved in teaching the subject: Loránd Alexa, PhD student; Andrea Kántor, PhD student
Name and level of the program: Agricultural Environmental Management Engineering MSc
Subject type: compulsory
Teaching timetable of the subject, type of examination: 2+1, practical course mark
Credit value of the subject: 3

Purpose of teaching the subject: The main aim of the lectures is to know the physical, chemical and biological/microbiological hazards which have important effects on food chain safety. In this semester, students will know the methodology of risk analysis (mainly the risk assessment) and the methodology of the determination of safe human dose, tolerable intakes and other toxicological values. Student will know the methodology of hazard analysis and preparation of HACCP plan.

Content of the subject (14 weeks):

1. Food quality and influencing factors of food quality
2. Influencing factors of food safety
3. Regulations, directives, standards relation to animal origin foods
4. Introduction to toxicology
5. Chemical hazards
6. Microbiological hazards
7. Foodborne diseases
8. Introduction to risk analysis
9. Methodology of HACCP plan preparation
10. Preliminary risk management activities
11. Risk management and risk communication
12. Chemical risk assessment
13. Microbiological risk assessment
14. Hazards of genetically modified plants and foods

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.

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

Teaching aids: Slides of lectures

Recommended literature:

IPCS (2010): WHO human health risk assessment toolkit: chemical hazards. ISBN: 978-92-4-154807-6

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

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

Regulations, directives, standards

17/2018 academic year II. semester

Name and code of the subject: **Water management II, MTMKG7011A**
Name and title of the person responsible for the subject: Dr. habil. Zsembeli József, tudományos főmunkatárs, PhD
Additional instructors involved in teaching the subject:
Name and level of the program: Agricultural Engineer in Environmental Management MSc
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: Causes and conditions of forming of excess water. Excess water systems and water shed areas in plain lands. Controlled outlet of excess waters taking the changeable hydrological conditions for a longer term into consideration. Tools of implementation, technical, agrotechnical and agronomical measures aiming excess water management. Designing and setting of outlet systems. Setting and maintaining excess water outlet canals. Objects of excess water outlet canals, objects serving outlet water control. Preparation of water shed management plans. Retaining and fast outlet of excess waters in a particular area. Utilisation of excess waters for the decrease of water demand of irrigation. Reutilisation of waters, the quality of retained, stored water. Management focussing on retaining excess waters in order to mitigate the harmful effects of climate change and droughts. Review of technological practices, activities of irrigation management concerning agriculture and environmental management. Review of theoretical knowledge and exercises in practice. Basic knowledge of irrigation techniques, process of setting of an irrigation system, general information on automatic irrigation systems, main elements of irrigation systems, features, application of sprinklers, controlling automatics, controlling types, types and application of magnetic valves, types and application of sensors, other parts (filters, pipes, fittings), junction of pipes, preparation solutions for winter, pumps used in irrigation techniques, theory and practice of designing, theory of setting and installation, handing over of irrigation systems.

Content of the subject (14 weeks):

1. 1. Basic definitions of excess water management
2. Causes and conditions of forming of excess water
3. Technical, agrotechnical and agronomical measures of excess water management
4. Setting, maintaining and objects of excess water outlet canals
5. 5. Preparation of water shed management plans
6. Utilisation of excess waters for the decrease of water demand of irrigation
7. Reutilisation of waters, the quality of retained, stored water
8. Fundamentals and basic definitions of irrigation technology
9. Elements and techniques of surface irrigation
10. Elements and techniques of sprinkler irrigation
11. Elements and techniques of micro-irrigation
12. Pumps applied in irrigation
13. Theory and practice of irrigation design
14. Irrigation systems in the XXI century

Type of mid-term examination:

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

Teaching aids:

Recommended literature:

1. Larry W. Mays (2011): Water resources engineering. ISBN-13: 978-0470460641, ISBN-10: 0470460644
2. Nakagami, Ken'ichi, Kubota, Jumpei, Setiawan, Budi Indra (Eds.) (2016): Sustainable water Management. Springer. ISBN: 9789811012044 9811012040 9811012024 9789811012020
3. Larry Keesen; Cindy Code (1995): The Complete Irrigation Workbook: Design, Installation, Maintenance & Water Management. GIE Media, Inc., Richfield OH.
4. Stephen W. Smith (1997): Landscape Irrigation: Design and Management. John Wiley & Sons, Inc., Hoboken, New Jersey

REQUIREMENTS
18/2017 academic year II. semester

Name and code of the subject: **Environmental technologies I - Soil remediation, soil protection, biotechnology in agriculture, MTMKG7013A**
Name and title of the person responsible for the subject: Dr. habil. Attila Nagy, associate professor
Additional instructors involved in teaching the subject:
Name and level of the program: Agricultural Engineer in Environmental Management MSc
Subject type: optional
Teaching timetable of the subject, type of examination: 2+1 K
Credit value of the subject: 3

Purpose of teaching the subject: This course reviews the basic knowledge of soil pollution, characterization methods of polluted sites, regulations of remediation in Hungary, contamination transport processes in soils, and biological, chemical, physical, phytoremediation (clean-up) technologies in details. Introduction of the reasons and consequences of the main soil degradation processes. Introduction of the technical, agronomical, soil protection, chemical, mechanical, complex amelioration and recultivation methods suitable for the moderation of the unfavourable effects.

Content of the subject (14 weeks):

1. Definition of remediation, national and international background and main steps of remediation plans and environmental status assessment
2. Requirements of site characterization, regulation for underground water and geological medium in EU
3. Sampling methods, impoundment methods for contaminated sites
4. Pollution transport in soil and pollution distribution and transformation in soil
5. Aspects of appropriate remediation technologies
6. In-situ and ex-situ physical remediation methods
7. In-situ and ex-situ chemical remediation methods
8. In-situ and ex-situ biological remediation methods, Phytoremediation methods
9. The soil conservation, land reclamation, environmental and soil acidification, salinization, secondary salinization, soil structure degradation, soil compaction.
10. Improving acidic and saline soils.
11. Improve sandy soils, improving soil physical properties of deep ploughing.
12. Water erosion. Technical and agronomic possibilities of protection against erosion.
13. Wind Erosion. Protection against deflation agronomic possibilities.
14. Complex amelioration (soil improvement, drainage, surface drainage and subsurface drainage).

Type of mid-term examination:

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

Teaching aids:

Recommended literature:

1. Prasad, MNV. 2005. Trace Elements in the Environment: Biogeochemistry, Biotechnology, and Bioremediation CRC Press/Taylor & Francis Group Boca Raton FL 33487 USA 744 ISBN 978-1-56670-685-8
2. P Lens, T Grotenhuis, G Malina, H Tabak 2005. Soil and Sediment Remediation. IWA Publishing London SW1H 0QS United Kingdom 544 ISBN 9781843391005
3. Neilson, Alasdair H. 2007. Environmental Degradation and Transformation of Organic Chemicals. Taylor & Francis (USA) Philadelphia, PA 19106 USA ISBN 9780849372414
4. Mirsal I.A. 2004. Soil pollution: Origin, Monitoring and Remediation Spreinger 312. ISBN: 978-3-540-70775-5
5. Saligram Bhatt (2004): Environment Protection and Sustainable Development. APH Publishing. 241. p. ISBN 9788176485128

REQUIREMENTS
2017/2018 academic year II. semester

Name and code of the subject: Agricultural and Environmental Policy MTMKG7022A

Name and title of the person responsible for the subject: Dr. Juhász Csaba, associate professor

Additional instructors involved in teaching the subject: Dr. Szőllősi Nikolett, assistant professor
Name and level of the program: Agricultural Environmental Management Engineering

Subject type: obligatory

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

Credit value of the subject: 3

Purpose of teaching the subject: The general aim of the course is to increase the knowledge on rural development and agricultural policy in favour of environmentally responsible farming based on sustainable use of natural resources. Additionally, agricultural environmental management engineering students get information on agro- and environmental policies of the European Union and Hungary. Students understand the work of agricultural and environmental policy systems, and the connections among the different actions.

Content of the subject (9 weeks):

1. History and future of the Common Agricultural Policy.
2. Common Agricultural Policy and rural development. SPS and SAPS systems, sectoral policies, organisation of agricultural market, cross-compliance.
3. Application of CAP at national level. Review of agricultural policy regulation for selected countries.
4. Definition and principles of agricultural policy. Tools of agricultural policy. The agricultural policy of the European Union.
5. Environmental protection and policy in Hungary.
6. National Environmental Protection Programmes.
7. Environmental policy and other related sectoral policies (climate, energy, transport, etc.)
8. Structural and institutional system of agricultural policy.
9. Environmental policy in the business sector, EP at company level.

Summary of content – practice (9 weeks):

1. Introduction into Agricultural Policy.
2. Formulating Agricultural Policy in EU.
3. Direct payment.
4. Cross compliance.
5. Agri-Environmental Scheme, measures.
6. Agriculture and climate change.
7. Organic Farming.
8. Organic livestock production.

9. Presentation and report.

Type of mid-term examination:
Written and/or verbal colloquium.

Method of assessment (semester examination mark - report, practical grade, colloquium, examination):
The implementation of the practices. Missing the practice in accordance with the University of Debrecen Study and Exam Regulations. Active participation in exercises. Completing exercises. Giving presentation

Teaching aids:
ppt presentations.

Recommended literature:
Tom Delreux, T.-Sander Happaerts, S.:(2016). Environmental Policy and Politics in the European Union. Palgrave. 320.p. ISBN: 9780230244269.
Jordan, A.-Adelle, C.:(2012). Environmental Policy in the EU: Actors, institutions and processes. Rautledge, Abington. 392.p. ISBN: 978-1849714693
OECD (2016), Agricultural Policy Monitoring and Evaluation 2016 (Summary), OECD Publishing, Paris. 136.p. ISBN: 9789264253537 (PDF); 9789264259126 (EPUB); 9789264208933 (print).
Tangermann, S.-von Cramon-Taubadel, S.:(2013). Agricultural Policy in the European Union. Universität Göttingen. 75.p. ISSN 1865-2697.
Tropea, F.:(2016). Common Agricultural Policy 2014- 2020. European Parliamentary Research Service. 36.p. ISBN: 978-92-823-9357-4.

REQUIREMENTS
Academic year 2017/2018, semester 2

Name and code of the subject: Management Systems (EMS, QMS, FSMS), MTMKG7023A
Name and title of the person responsible for the subject: Dr. Nikolett Szőllősi, assistant professor
Additional instructors involved in teaching the subject: -
Name and level of the program: Agricultural Environmental Management Engineering MSc
Subject type: compulsory
Teaching timetable of the subject, type of examination: **1**+2, G
Credit value of the subject: 3

Purpose of teaching the subject: Students get acquainted with the management approach of companies and the tasks of management, the tasks and skills of managers, which improveable. In addition, they learn about the relationship between the company and the environment. We focus on the possibilities of end-of-pipe environmental protection, above all the possibilities of cleaner production and the spread of voluntary environmental management tools (ISO 14000, EMAS) in the globalizing economy. More and more large companies place great emphasis on the professional implementation of energy management in all their activities. The role of companies in social responsibility is also becoming more and more important. The precondition for competitive corporate operation is, among other things, the provision of workplace environmental, health and safety conditions.

Content of the subject (14 weeks):

1. Introduction to Principles of Management
2. Personality, Attitudes, and Work Behaviors, leading people and organization
3. Organization structure and changes, organization culture, managing geouprs and teams
4. Decision making, communication, motivationg employees
5. The essential of Controll, Strategic Human Resource Management
6. History of Enviromental Management, standardisation, ECS 7750; EMAS; ISO 14001.
7. Implementation of Environmental Management System, documentation, operating. Continual development. Audit, audit types, audit process, documentation, integrated auditing, ISO 19011.
8. Environmental regulations, tools of environmental business management. Evaluation of environmental effects: indicators. Cleaner production. Life cycle analysis Analysis.
9. History of quality management, development of Quality Management Systems, Total Quality Management (TQM).
10. Quality management systems. Requirements (ISO 9001:2000)
11. Occupational health and safety management systems. Requirements (BS OHSAS 18001),
    ISO 28001.
12. History of HACCP, System of HACCP (Hazard Analysis Critical Control Points), documentation, operating. Food Safety Management System ISO 22000.
13. Possibilities given by integrated systems, collective establishment.
14. Management Information Systems, ERP Systems

Type of mid-term examination: Completing assignments / exercises listed in Exercise book: Practical exercises for the course of Management Systems

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

Teaching aids: ppt presentations, online websites

Recommended literature:

1. Management Principles 2012. This book is licensed under a Creative Commons by-nc-sa 3.0 (http://creativecommons.org/licenses/by-nc-sa/ 3.0/) license. p. 714 http://2012books.lardbucket.org/pdfs/management-principles-v1.0.pdf
2. Juhász, C., Szőllősi, N. 2009. Environmental management. Jegyzet. Debreceni Egyetem, Debrecen. http://www.tankonyvtar.hu/hu/tartalom/tamop425/0032_kornyezetiranyitas_es_minosegbiztositas/adatok.html
3. James Reinhard, Brad Ames, Andrew Robertson, Rita Thakkar, Ryon Pulsipher, David Bentley 2012. Integrated Auditing Practice Guide. The Institute of Internal Auditors.
4. United States Department of Agriculture, Food Safety and Inspection Service 1997. Guidebook For The Preparation Of HACCP Plans. p. 67.
5. Implementation Guidance for ISO 9001:2015. International Organization for Standardization. p. 7.