

BULLETIN

UNIVERSITY OF DEBRECEN

ACADEMIC YEAR 2015/2016

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

AGRICULTURAL ENGINEERING BSc

Coordinating Center for International Education

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CHAPTER 1

UNIVERSITY OF DEBRECEN

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

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

Legal status of the University of Debrecen: state university

Founder of the University of Debrecen: Hungarian State Parliament

Supervisory body of the University of Debrecen: Ministry of Education

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

Number of Faculties at the University of Debrecen: 14

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

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

Number of students at the University of Debrecen: 28812

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

Full time teachers of the University of Debrecen: 1421

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

CHAPTER 2

DEAN'S WELCOME

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

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

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

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

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

Prof. Dr. István Komlósi
Dean

CHAPTER 3 HISTORY OF THE FACULTY

History of the Faculty

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

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

CHAPTER 4

MISSION OF THE FACULTY

Mission of the Faculty

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

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

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

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

CHAPTER 5

THE ORGANIZATIONAL STRUCTURE OF THE UNIVERSITY

RECTOR OF THE UNIVERSITY OF DEBRECEN

Rector: Zoltán Szilvássy M.D., Ph.D, D.Sc.
Address: 4032 Debrecen, Egyetem tér 1.
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FACULTY OF AGRICULTURAL AND FOOD SCIENCES AND ENVIRONMENTAL MANAGEMENT

Dean: Prof. Dr. habil. István Komlósi
Address: 4032 Debrecen, Böszörményi út 138.
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Vice Dean for Educational Affairs: Dr. habil. Csaba Juhász
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Vice Dean of Scientific Affairs: Dr. László Stündl
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DEAN'S OFFICE

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

REGISTRAR'S OFFICE

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

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

CHAPTER 6
THE DEPARTMENTS OF THE FACULTY

INSTITUTE OF AGRICULTURAL CHEMISTRY AND SOIL SCIENCE

Böszörményi út 138., Debrecen, 4032

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

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

Böszörményi út 138., Debrecen, 4032

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

Böszörményi út 138., Debrecen, 4032

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

CHAPTER 6

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

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

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

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

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

Animal Genetics Laboratory Böszörményi út 138., Debrecen, 4032

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

INSTITUTE OF FOOD SCIENCE

Böszörményi út 138., Debrecen, 4032

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

INSTITUTE FOR LAND UTILISATION, TECHNOLOGY AND REGIONAL DEVELOPMENT

Böszörményi út 138., Debrecen, 4032

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

INSTITUTE OF HORTICULTURE

Böszörményi út 138., Debrecen, 4032

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

CHAPTER 6

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

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

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

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

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

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

Genetics Group

Böszörményi út 138., Debrecen, 4032

Head Pál Pepó C.Sc.

INSTITUTE OF PLANT PROTECTION

Böszörményi út 138., Debrecen, 4032

Head of Institute György János Kövics C.Sc.

Associate Professor András Bozsik C.Sc.

László Radócz C.Sc.

Assistant Professor Antal Nagy Ph.D.

Senior Research Fellow Gábor Tarcali Ph.D.

Secretary Ms. Tünde Szabóné Asbolt

AGRICULTURAL LABORATORY CENTRE

Böszörményi út 138., Debrecen, 4032

Assistant Research Fellow Ms. Nóra Óri

Technical Assistant Ms. Nóra Bessenyei Tarpay
Csaba Kiss

Ms. Hajnalka Pákozdy

Ms. Istvánné Sörös

Gábor Tóth M.D.

Associate Professor Ms. Tünde Pusztahelyi Ph.D.

INSTITUTE OF WATER AND ENVIRONMENTAL MANAGEMENT

Böszörményi út 138., Debrecen, 4032

Deputy Head Csaba Juhász Ph.D.

Head of Institute János Tamás D.Sc.

Assistant Research Fellow Péter Riczu

Ms. Nikolett Szöllösi

Professor Lajos Blaskó D.Sc.

Technical Assistant Ms. Kamilla Berényi-Katona

Ms. Katalin Bökfí

Associate Professor Ms. Elza Kovács Ph.D.

Assistant Lecturer Ms. Tünde Fórián Ph.D.

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

FACULTY OF ECONOMICS AND BUSINESS

Böszörményi út 138., Debrecen, 4032

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

THE DEPARTMENTS OF THE FACULTY

Zoltán Csiki M.D., Ph.D.

Ms. Zita Hajdu Ph.D.

Ms. Judit Katonáné Kovács Ph.D.

Sándor Kovács Ph.D.

Ms. Ildikó Tar Ph.D.

Ferenc Buzás Ph.D.

Research Fellow

CHAPTER 7

UNIVERSITY CALENDAR

Academic calendar

2015/2016

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

CHAPTER 8

AGRICULTURAL ENGINEERING BSC PROGRAMME

AGRICULTURE ENGINEERING BSC PROGRAMME

About the course:

The aim of the agricultural engineering qualification is to train agricultural engineers who have general knowledge in the field of natural-, technical, agricultural sciences, economic knowledge of the area of agricultural processing and farming furthermore have theoretical knowledge of adequate depth. Besides the theoretical knowledge emphasis is put on practical training and on the acquisition of different fields of agricultural sciences: plant cultivation, animal husbandry, horticulture, fish farming, game management and forestry.

Requirements:

Application requirements: General Certificate of Education (G.C.E), upper-intermediate English language certificate

Length of the Study programme: 6 semesters for academic studies+1 semester long farm management practise period

Number of ECTS credits: 180+30

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

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

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

Tests are evaluated according to the followings:

ScoreGrade

0-59fail (1)

60-69pass (2)

70-79satisfactory (3)

80-89good (4)

90-100excellent (5)

absence for any reason counts as 0%.

CHAPTER 8

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

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

Careers:

Postgraduates may progress to a MSc. courses or find employment in the agricultural sectors (for example in the field of crop production, horticulture, animal breeding, forest and game management, farm-and business management)

Abbreviations of the Curriculum table:

L - Lecture

S - Seminar

P - Practice

ESE - Written or oral exam in the exam period

AW5 - 5-grading evaluation of the semester work

SIGN - Signature (without grade) of the semester work

Crd. - Credits

CHAPTER 9

CURRICULUM OF THE FULL TIME PROGRAMME

Compulsory courses														Prerequisites of taking the subject	
1. year															
Subjects	Neptun code	1 st semester						2 nd semester							
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.				
Agricultural and Food Microbiology I.	MTBE010						2		1	ESE	0			0	None
Agricultural botany	MTBE005	2		1	ESE	5									None
Chemistry Agricultural	MTBE004	2		2	ESE	5									None
Agricultural fundamentals	MTBE015						2			ESE	3				None
Agricultural Practice I.	MTBE045			40	SIGN	0									None
Agricultural Practice II.	MTBE046								40	SIGN	0				None
Animal Physiology	MTBE008						2		1	ESE	3				None
Basics of Plant Physiology	MTBE012						2		1	ESE	3				None
Environmental Management	MTBE016						2			ESE	3				None
History of agriculture and EU knowledge	MTBE002	2			ESE	5									None
Informatics	MTBE007			2	ESE	3									None

Compulsory courses														Prerequisites of taking the subject	
1. year (continued)															
Subjects	Neptun code	1st semester						2nd semester							
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.				
Mathematics I.	MTBE003	2		1	ESE	5									None
Organic and biochemistry	MTBE009						2			1	ESE	4			None
Rural Development	MTBE011						2			1	ESE	3			None
Water management I.	MTBE014						2			1	ESE	4			None
Zoology	MTBE001	2		1	ESE	4									None

Compulsory courses														Prerequisites of taking the subject	
2. year															
Subjects	Neptun code	1 st semester					2 nd semester								
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.				
MachineryAgricultural	MTBE019	2		2	ESE	4									None
Agricultural Practice III.	MTBE047			40	SIGN	0									None
Agricultural Practice IV.	MTBE048									40	SIGN	0			None
Agrochemistry	MTBE023	2		1	ESE	3									None
Agroecology	MTBE024						2				AW5	3			None
Animal husbandry I.	MTBE026						2			1	ESE	4			None
Crop Production I.	MTBE022	2		1	ESE	4									None
Crop Production II.	MTBE028						2			1	ESE	4			None
Economic Sciences I.	MTBE021	4			ESE	3									None
Economic Sciences II.	MTBE029						4			1	ESE	3			None
Feeding for animals	MTBE025	2		2	ESE	5									None
Land use and regional development	MTBE017	2		2	ESE	4									None
Plant Pathology	MTBE054						1			1	AW5	3			None
Project work I.	MTBE050			4	AW5	4									None

Compulsory courses														Prerequisites of taking the subject
2. year (continued)														
Subjects	Neptun code	1st semester						2nd semester						
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.			
Project work II.	MTBE051										4	AW/5	4	None
Soil Science	MTBE013	2		1	ESE	3								None
Water management II.	MTBE030						2			1	ESE	3	None	

Compulsory courses														Prerequisites of taking the subject	
3. year															
Subjects	Nepton code	1st semester						2nd semester							
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.				
Agricultural entomology	MTBE055	1		1	AW5	3									None
Agricultural Practice V.	MTBE049			40	SIGN	0									None
Animal Health	MTBE038						1				1	AW5	2		None
Animal husbandry II.	MTBE032	2		1	ESE	3									None
Economic Sciences III.	MTBE035	4			ESE	4									None
Farm business management	MTBE041						2					ESE	2		None
Forest and game management	MTBE042						2				1	ESE	5		None
managementGrassland	MTBE043						1				1	AW5	2		None
Horticulture II.	MTBE033	1		1	ESE	2									None
Integrated plant protection	MTBE044						1				1	AW5	3		None
Project work III.	MTBE052			4	AW5	4									None
Project work IV.	MTBE052										4	AW5	4		None

Compulsory courses													Prerequisites of taking the subject				
3. year (continued)																	
Subjects	Neptun code	1st semester					2nd semester										
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.						
Quality management system	MTBE040										2				ESE	2	None
Regulation and Administration of Agriculture	MTBE037										2				ESE	3	None
Statistics	MTBE036	1		1	ESE	3											None

Required elective courses													Prerequisites of taking the subject		
2. year															
Subjects	Neptun code	1 st semester				2 nd semester				L	S	P		Exam	Crd.
		L	S	P	Exam	Crd.	L	S	P				Exam		
Irrigated farming	MTBE061									2			ESE	2	None
Medicinal plants and spice crops production	MTBE063									2			ESE	2	None
Management Operations	MTBE064									2			ESE	4	None
Soil ecology	MTBE060	2		1	ESE	4									None

Required elective courses														Prerequisites of taking the subject	
3. year															
Subjects	Neptun code	1 st semester						2 nd semester							
		L	S	P	Exam	Crd.	L	S	P	Exam	Crd.				
Etology	MTBE056	1			ESE	1									None
Forcing and early vegetable production	MTBE057	2			ESE	4									None
Lake economical husbandry technologies	MTBE058						2					ESE	2		None
Plant nutrition management	MTBE062	2			ESE	2									None
Qualification of animal products	MTBE059						2					ESE	2		None

CHAPTER 10

COURSE DESCRIPTIONS

Department of Animal Husbandry

Subject: **ANIMAL PHYSIOLOGY**

Year, Semester: 1st year/2nd semester

Lecture: **2**

Practical: **1**

Requirements

Course content: The general object of animal physiology is to give a basic understanding of domestic animal's anatomy and physiology for the students. It assumes a basic background in biology and gives a greater understanding of essential anatomy and function of the animal systems'.

Thematic plan of course:

1st. Cells and cell components. The organ systems and devices. The homeostasis. 2nd: Planes and directions of the animal's body. The skeleton, the bones of the body and the head. Parts of the body. The large cavities. 3rd: The structure contained breathing apparatus, breathing physiology. 4 th: The blood-system. The cells of the blood, blood plasma components. The blood and lymphatic circulation. Basic Immunology. The immunity. 5th Functioning of the digestive apparatus 6th The carbohydrate, fat digestion. Material and energy balance, thermoregulation. 7th The digestion of proteins and nucleic acids, absorption and metabolism. 8th The liver and pancreatic function. Vitamins and minerals 9th The endocrine system works. The stress 10th The muscle system and function. 11th Division of the nervous system, structure and function 12th The excretory organs 13th Anatomy of the female and male sex organs, the hormonal control of sexual function 14th The conception, fetal development. Cause of postpartum hormonal changes in the course of giving birth. 15th The sensory structure and function..

Required reading materials

Willaim O Reece: Physiology of Domestic Animals.

Lippincott Willims and Wilkins, ISBN: 0683072404

Department of Plant Biotechnology

Subject: **AGRICULTURAL BOTANY**

Year, Semester: 1st year/1st semester

Lecture: **2**

Practical: **1**

Requirements

Course content: Anatomy, morphology and taxonomy of the most important plant families and their species and cultivars

Thematic plan of lectures:

1. Basic plant cytology 1. Cell wall, phospholipid membranes, cytosol, nucleus, nucleolus.

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- Endoplasmic reticulum, ribosomes, Golgi apparatus and vesicles.
2. Basic plant cytology 2. Chloroplast and mitochondria, vacuole.
3. Plant histology 1. Meristematic tissues, permanent tissues. Epidermis, parenchyma, sclerenchyma, kollenchyma, aerenchyma, xylem, phloem.
4. Plant histology 2. Anatomy of root, stem, leaf. Secondary growth, wood anatomy.
5. Plant morphology 1. Root structure, stem structure, leaf structure.
6. Plant morphology 2. Flower structure, inflorescence structure.
7. Fruit and seed development and structure.
8. Plant taxonomy 1. *Bryophyta*, *Pteridophyta*.
9. Plant taxonomy 2. *Spermatophyta*: *Gymnospermatophyta* and *Angiospermatophyta*.
10. Plant taxonomy 3. Dicotyledoneae: *Ranunculaceae*, *Papaveraceae*, *Caryophyllaceae*, *Chenopodiaceae*, *Amaranthaceae*, *Polygonaceae*, *Fagaceae*, *Betulaceae*, *Juglandaceae*.
11. Plant taxonomy 4. *Cannabaceae*, *Urticaceae*, *Grossulariaceae*, *Rosaceae*, *Fabaceae*.
12. Plant taxonomy 5. *Linaceae*, *Vitaceae*, *Apiaceae*, *Brassicaceae*, *Cucurbitaceae*, *Malvaceae*, *Solanaceae*.
13. Plant taxonomy 6. *Cuscutaceae*, *Convolvulaceae*, *Scropulariaceae*, *Lamiaceae*, *Orobanchaceae*, *Asteraceae*. Monocotyledoneae: *Asparagaceae*, *Alliaceae*, *Poaceae*, *Cyperaceae*.

Required reading materials

Dirk R. Walters, David J. Keil: Vascular plant taxonomy.

Kendall/Hunt Pub.Co., Cornell University, 1988.

O P Sharma: Plant taxonomy.

Tata McGraw-Hill Education, 1993. ISBN: 00746037369780074603

Subhash C. Datta: Systematic Botany.

New Age International, 1988. ISBN: 8122400132

Faculty of Economics and Business

Subject: **HISTORY OF AGRICULTURE AND EU KNOWLEDGE**

Year, Semester: 1st year/1st semester

Lecture: **2**

Requirements

Course content: The target of the course is to ensure the general knowledge of students in zoology, to introduce the structure and functioning of the animal cell, the types of animal tissues, their basic structure, significance, the general definitions of reproduction and ontogenesis. To introduce the main taxonomic units, and to teach to recognize invertebrate and vertebrate species in practice, to evaluate these species considering their nature conservation and possible economic values and to evaluate the human effects on the world of animals are also educational objectives.

Course content:

I. Agricultural history

Aim: Introducing students to the universal and Hungarian agricultural history and its development, deepening the specific and general profession culture with special regard to the development history of the European and Hungarian agriculture. In addition to the past, it is also part of the curriculum to describe the present and near future, as well as its development peculiarities.

II. EU knowledge

Aim: Reviewing the past, present, history and interconnections of the general European integration processes, as well as the theory and practice of the European Union subsidisation (structural) policy, with special regard to the basic principles and Hungarian practice of the Common Agricultural Policy (CAP).

Thematic plan of lectures:

Lecture 1. Course requirements, thematics. Fundamental conception.

Lecture 2. Development of agriculture, ancient forms of agriculture in the Worlds and the early Hungarian society

Lecture 3. Feudal economic-social relations in the middle-ages and the late middle-ages and the history of agricultural development in Europe (6th – 15th century)

Lecture 4. Feudal economic-social relations in the middle-ages and the late middle-ages and the history of agricultural development in Europe (10th – 17th century)

Lecture 5. Development history of the capitalist economy and agriculture between the 15th – 19th century

Lecture 6. The economy and agroecology of Hungary in the transition era from classic feudalism to capitalism (1711-1867)

Lecture 7. The unfolding and the developed capitalist economy and agriculture in the dualist Hungary (1849-1914)

Lecture 8. Main characteristics and development history of world economy between the two world wars (1920-1945)

Lecture 9. Development history of the Hungarian agriculture between the two world wars (1918-1939)

Lecture 10. Main tendencies of the economic and agricultural development of the developed countries after the second world war

Lecture 11. Development history of the Hungarian agriculture after 1945

Lecture 12. General characteristics and tendencies of the transition of the Hungarian agriculture after the change of the political regime in 1989/90

Lecture 13. Brief development history and regional (structural) subsidisation politics of the EU

Lecture 14. Regions and regionalism in the European Union and Hungary

Subject: **INFORMATICS**

Year, Semester: 1st year/1st semester

Practical: 2

Requirements

Course content: Irrespective of their preliminary study requirements, students are required to gain advanced IT skills to be used in their further studies and in their graduate professional practical work.

It implies:

- obtaining the necessary knowledge on Internet-use.
- developing an advanced-level knowledge of MS-Office (Word; Excel; Power Point) to be able to solve complex tasks.

The course is basically application oriented, a number of practical tasks are to be solved.

Required reading materials

Joyce cox, Curtis frye, Steve Lambert, Joan peppernau, Katherine murray: Microsoft Office Step by Step
2007.

Paul McFedries: Formulas and Functions with microsoft Office Excel 2007

Subject: **MATHEMATICS I.**

Year, Semester: 1st year/1st semester

Lecture: **2**

Practical: **1**

Requirements

Course content: The main goal of the subject is that the students could be introduced to the basic methods and terminology or definitions in mathematics which can be used in economics. The differential calculus of one-variable functions and its practical application is in the center of interest as well as the extreme value and elasticity calculation of one-variable functions. During the course of practical lessons students should gain experience in problem solving from the various topics of the subject. Main topics: Theory of sets. Sets of numbers, Classification and characteristics of one-variable real functions. Theorems of limit calculation. Limit calculation, continuity and derivate of functions. Examination of functions, elasticity. Extrame values calculation of functions with practical applications. Practical applications of the differential calculus.

Required reading materials

H. P. Greenspan-D.J. Benney: Calculus: an introduction to Applied Mathematics
Breukelen Press, Brookline, Ma, USA, 1997. ISBN: 0-9626998-1-0

S.T. Tan: Applied Mathematics for Managerial, Life and Social Sciences
6. Brooks/Cole, Belmont, CA, USA, 2013. ISBN: 1-133-10894-6

K. Sydsater-P.I. Hammond: Essential Mathematics for Economic Analysis
Prentice-Hall, London, UK, 2008. ISBN: 978-0-273-71324-1

Institute of Agricultural Chemistry and Soil Science

Subject: **AGRICULTURAL CHEMISTRY**

Year, Semester: 1st year/1st semester

Lecture: **2**

Practical: **2**

Requirements

Learn the basics and principles of General and inorganic chemistry. Understanding the agricultural production determining and influencing chemical processes (plant and animal physiology, plant nutrition, plant protection, animal feeding).

Atomic structure: basic and electronic structure of atoms. The Bohr-, Sommerfeld- and quantum theory, quantum numbers and atomic orbitals. Electron configurations and periodicity. Ionic, covalent and dative bonding. Chemical nomenclature. Molecular geometry. Reactions in aqueous

solutions. Gaseous, liquid and solid state. Solutions, colligative properties. Thermo chemistry: calorimetry, enthalpy, entropy, reaction heat, interpretation of free energy. Reaction kinetics, reversible reactions, equilibrium. Protolytic reactions: acid-base concepts, pH, buffers, indicators. Salt hydrolysis. Complexes and chelate compounds. Electrochemistry: Voltaic cells, electrolysis, electrode potential, rH, oxidation-reduction reactions, oxidation states. Colloid chemistry. Non-metallic elements and their compounds: hydrogen, oxygen, nitrogen, carbon, silicon, phosphorus, sulfur, halogen elements. Metallic elements and their compounds: alkali metals and alkaline earth metals, transition elements.

Required reading materials

Blake, R.: Introductory chemistry.

Pearson, London-New York, 2005. ISBN: 9780131446021

Ebbing, D.D., Gammon, S.D.: General Chemistry

Cengage learning, Stamford, 2009. ISBN: 9780618857487

Ralph Petrucci, F. Herring, Jeffry Madura, Carey Bissonnette: General Chemistry: Principles and Modern Applications with Mastering Chemistry.

Pearson, London-New York, 2009. ISBN: 9781442511477

House, J.E.: Inorganic Chemistry

2.. Elsevier Academic Press, Amsterdam-Boston-Heidelberg-London-New York-Oxford-Paris-san Fransisco-singapore-Sydney-Tokyo, 2013. ISBN: 9780123851109

Institute of Animal Science, Biotechnology and Nature Conservation

Subject: **AGRICULTURAL PRACTICE I.**

Year, Semester: 1st year/1st semester

Practical: **40**

Requirements

Course content: The student will get to know and practice the fundamental working procedures of the animal breeding for various species. Different technologies will be introduced and they will learn the conditions of work organization. The working table of blue-collar workers and logic of work organization will also be shown for the students. They will know the different storage system of feeds, forages and litters. They will co-operate in the transportation of animals. They can learn the constant work discipline, the continuous process line of animal product production and how the proper amount of working demand can be satisfied.

Subject: **ZOOLOGY**

Year, Semester: 1st year/1st semester

Lecture: **2**

Practical: **1**

Requirements

Hours per week: lecture, 2+1

Credit: 4

Assessment: examination

Course coordinator: Lajos Juhász PhD, senior lecturer

Other participant tutors: Lajos Kozák PhD, assistant professor

Course content: The target of the course is to ensure the general knowledge of students in zoology, to introduce the structure and functioning of the animal cell, the types of animal tissues, their basic structure, significance, the general definitions of reproduction and ontogenesis. To introduce the main taxonomic units, and to teach to recognize invertebrate and vertebrate species in practice, to evaluate these species considering their nature conservation and possible economic values and to evaluate the human effects on the world of animals are also educational objectives.

Referenced bibliography:

Allaby, M (2003): A dictionary of zoology. OUP Oxford, ISBN 978-0198607588, 608 pp

Barnes, R.D. Invertebrate Zoology (1982) VI Edition. Holt Saunders International Edition.

Kardong, K.V. (2005) Vertebrates Comparative Anatomy, Function and evolution. IV Edition. McGraw-Hill Higher Education.

Required reading materials

Barnes, R.D.: Invertebrate Zoology

VI.. Holt Saunders International Edition, 1982.

Allaby, M: A dictionary of zoology.

OUP Oxford, 2003. ISBN: 978-0198607588

Kardong, K.V.: Vertebrates Comparative Anatomy, Function and Evolution

IV.. McGraw-Hill Higher Education,

Department of Plant Biotechnology

Subject: **BASICS OF PLANT PHYSIOLOGY**

Year, Semester: 1st year/2nd semester

Lecture: **2**

Practical: **1**

Requirements

Course content: The program of lecture starts with the main tasks of plant physiology, biochemical and cellular definitions. The following topics are discussed: photosynthetic light and dark reactions; respiratory system and its roles; water balance of plants; nutrient uptake and assimilation; plant hormones; physiology of germination, flowering and plant development; plant senescence

The lecture with practise is designed to provide comprehensive exposure to the subject of plant physiology. The student will learn about function of plants throughout their development from seeds through reproduction. Considerable experience in chemistry and botany is assumed. Lectures and laboratory practises are cover from the biochemical level through the organismal level. The laboratory exercises will complement the lectures. The study of plants as producers really important because of their position at the energy and elemental intake portion of the energy pyramid and the food net.

Required reading materials

Taiz, L., Zeiger, E.: Plant Physiology

4th. Sinauer associates, 2007.

Hopkins, W. G., Huner, N. P. A.: Introduction to Plant Physiology

5th. John Wiley&Sons, 2009.

Buchanan, B. B., Gruissem, W., Jones, R. L. : Biochemistry and Molecular Biology of Plants

John Wiley&Sons, Inc., 2000.

Institute for Land Utilisation, Technology and Regional Development

Subject: **RURAL DEVELOPMENT**

Year, Semester: 1st year/2nd semester

Lecture: **2**

Practical: **1**

Requirements

Course content: The aim of this course is to present the relationships and the features of the regional and settlement development in accordance with the regional politics of the European Union as well as to evaluate and interpret the European regional development policies. A further aim is to outline the historical dimensions, to make concepts clear, to examine the range of tools of development the European observations of regional development and the European practice of regional politics, with special regard to the EU's regional (structural) development and cohesion funding policy. The course covers the different regional policies, the European conditions of their range of tools and institutions and the theoretical and practical connections between the regional processes, the small regional and municipality development programs, as well as the methods and techniques of their management, conduction and implementation. As a result of completion of the course, students will be able to apply principles of advanced rural development, as potential managers or professional experts.

Required reading materials

Edward J. Blakely, Nancy Green Leigh: Planning Local Economic Development: Theory and practice

Sage Publications Inc., 2009. ISBN: 9781412960939

Andy Pike, Andres Rodriguez-Pose, John Tomaney: Handbook of Local and Regional Development

Taylor & Francis Ltd., 2010. ISBN: 9780415548311

Anne C. Steinemann, H. James Brown, William C. Apgar: Microeconomics for Public Decisions

Mason, OH: Thomson/South Western Press. (SAB), 2005. ISBN: 9780030264719

Institute of Agricultural Chemistry and Soil Science

Subject: **ORGANIC AND BIOCHEMISTRY**

Year, Semester: 1st year/2nd semester

Lecture: **2**

Practical: **1**

Requirements

Course content: Organic and biochemistry study the structure and constitutions of organic compounds occurring in plant and animal organisms such as intermediers, monomers and macro molecules. It discusses biological processes (metabolism processes) and their regulations, which take place in plant and animal cells. Energy balance of anabolism and catabolism, and their relationship with each other. Successful understanding of food chemistry and plant physiology is based on this subject. Our objective is to provide for students a thorough understanding in the principles of biochemistry,

Thematic plan of course:

1st week Hybridization of carbon: Classification of organic compounds based on their carbon skeleton and functional groups. Types of isomerization, carbon hydrogens, The most important organic chemical reactions (substitution, addition, polymerisation) dienes, polyenes (terpenes). Chemical properties of isoprenes compounds.

2nd week Classification and characterisation of alcohols. Chemical properties of alcohols. Aldehydes and ketons (classification, physical and chemical properties) Carbon hydrates. Monosaccharides: classification chemical properties and their most important representatives. Cyclic monosaccharides

3rd week Reactions of sugars. Reductive and non-reductive disaccharides. Free and reserve polysaccharides. Classification of carboxylic acids and their physical and chemical properties. Open chained saturated and unsaturated di and tricarboxylic acids. Classification and properties of esters.

4th week. Lipids. Classification, physical and chemical properties of lipids. Comparison of combined lipids, the most important lipids. Steroids, Chemical properties of substituted carboxylic acids

5th week Classification of amino acids and their chemical properties. Their zwitterion structure and their buffering capacity. Separation of them, gelelectrophoresis. Dipeptides, polypeptides. Structure and classification of proteins. Biological function of proteins

6th week Aromatic compounds. Structure of benzene, isomerization and its chemical reactions. Most important aromatic hydrocarbon groups. The conditions of aromatic nature. Aromatic alcohols, aldehydes, carboxylic acids. The phenols and quinones linkage system, their main representatives.

7th week Classification of heterocyclic compounds Five-membered heterocyclic compounds. The structure of pyrrole and imidazole, their derivatives. Structure of cyclic tetrapyrrole systems and linear tetrapyrrole, their properties and biological functions, major representatives. Six membered heterocyclic compounds. Pyridine and pyrimidine and their derivatives. Purine and its derivatives. Lactone-lactam tautomerism. Structure of nucleosides and nucleotides. The NAD⁺, NADP⁺, FAD, ATP, cyclic AMP and their biological role

8th week: primary and secondary structure of nucleic acids, Relationship between the structure and the biological function of nucleic acids. The structure of living organisms, and their supra molecular organization. Living organisms and their environment.

9th week: The role of water from the aspect of living beings. Enzymes. The nomenclature, structure and mechanism of enzymes. Factors affecting the activity of enzymes. Classification of enzymes. The regulation of enzyme activity

10th week Vitamins. Common feature of vitamins their classification. Fat-soluble and water-soluble

vitamins and their mechanisms.

11th week: Hormones. Mechanism of hormones. Hormones of pituitary, thyroid, parathyroid, pancreas, adrenal Sexual hormones Tissue hormones. Plant hormones. Photosynthesis. Light and dark photosynthesis. Sucrose and starch synthesis

12th weeks. Breakdown of carbohydrates. Glycolysis, citric acid cycle and the terminal oxidation reaction and energy balance. The direct oxidation of glucose (pentose phosphate cycle). Fermentation processes.

13th week: Resynthesis of glucose. Glycogen metabolism (Cori cycle). The metabolism of fats. The biosynthesis of fatty acids. The breakdown of saturated , unsaturated and odd carbon fatty acids, and their energy balance.

14th week glyoxylic acid cycle. Structure of amino acids. The origin of amino acids C-frame. Protein synthesis. Stages of protein synthesis, transcription, translation. Initiation, elongation, termination.

15th week: Hydrolysis of proteins, breakdown of amino acids and their relationship with citrate-circuit . Urea cycle. Relationship between cellular energy-producing and energy consuming processes. Representation of homeostasis maintenance enhanced by examples.

Required reading materials

Ida Kincses-Andrea Balla Kovács: Applied biochemistry
2013.

Sally Solomon: Introduzion to general, organic and biological chemistry
ISBN: 0070596611

Christopher K. Mathews, K.E. van Holde: Biochemistry
The Benjamin/Cummings Publishing Company, 1990. ISBN: 0805350152

Darnell, James E.: Molecular cell biology
1986. ISBN: 0716714485

Institute of Animal Science, Biotechnology and Nature Conservation

Subject: **AGRICULTURAL PRACTICE II.**

Year, Semester: 1st year/2nd semester

Practical: **40**

Requirements

Course content: The student will get to know and practice the fundamental working procedures of the animal breeding for various species. Different technologies will be introduced and they will learn the conditions of work organization. The working table of blue-collar workers and logic of work organization will also be shown for the students. They will know the different storage system of feeds, forages and litters. They will co-operate in the transportation of animals. They can learn the constant work discipline, the continuous process line of animal product production and how the proper amount of working demand can be satisfied.

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Subject: **AGRICULTURAL FUNDAMENTALS**

Year, Semester: 1st year/2nd semester

Lecture: **2**

Requirements

Course content: The aim of the course to familiarize the students with the basic of animal husbandry, with basic literacy, concepts, production and technical parameters required of breeding and keeping of various animal species. We discuss the importance of the different species in agriculture production and the basic physiological, breeding and technological parameters of the production of different products of animal origin.

Thematic plan of course:

1. The significance of agricultural production and animal husbandry
2. Basic concepts of animal husbandry
3. Chemical composition of the feed
4. Feed preparation, storage, preservation
5. Basic anatomical and physiological characteristics of farm animals I.
6. Basic anatomical and physiological characteristics of farm animals II.
7. Basics of dairy cattle breeding and keeping technology I.
8. Basics of dairy cattle breeding and keeping technology II.
9. Basics of meet cattle breeding and keeping technology
10. Basics of sheep breeding and keeping technology
11. Basics of pig breeding and keeping technology I.
12. Basics of pig breeding and keeping technology II.
13. Basics of poultry breeding and keeping technology
14. Basics of fish breeding and keeping technology
15. Basics of horse breeding and keeping technology

Required reading materials

Willaim O Reece: Physiology of Domestic Animals.

Lippincott Willims and Wilkins, ISBN: 0683072404

W. Haresing, DJA, Cole: Ruminant Nutrition. Butterworth.

1988. ISBN: 0407011640

Pond W. G. and maner JH: Swine Production and Nutrition.

AVI Publishing Company , 1984. ISBN: 0870554506

Schaible P.J.: Poultry feeds and Nutrition

AVI Publishing, 1970. ISBN: 870550659

Institute of Food Science

Subject: **AGRICULTURAL AND FOOD MICROBIOLOGY I.**

Year, Semester: 1st year/2nd semester

Lecture: **2**

Practical: **1**

Requirements

Course content: The purpose of this semester of Microbiology is to familiarize the student with those concepts that are basic to viruses and prokaryotic and eukaryotic cells. The basic topics in this

course are: the general principles for microbial growth, evolution and classification, descriptions of different prokaryotic, eukaryotic and other life forms; the natural ecology of microorganisms; the human use of microorganisms; and how microorganisms function in disease.

In the laboratory students will learn basic microbiological techniques, to acquire basic bacteriological skills and be able to successfully use them.

Required reading materials

Madigan, M.T, Martinko, J. M., Dunlap, D. P., Clack, D. P.: Brock Biology of Microorganisms
2009. ISBN: 0321536150

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

RSC Publishing, Cambridge, 2008. ISBN: 9780854042845

Lightfoot, N., F.; Maier, E. A. : Microbiological analysis of food and water: guidelines for quality for assurance.

Elsevier Science Inc, New York, 1998. ISBN: 0444829113

Institute of Water and Environmental Management

Subject: **ENVIRONMENTAL MANAGEMENT**

Year, Semester: 1st year/2nd semester

Lecture: **2**

Requirements

Course content: In the first half of the semester the water plays the main role. The environment and the economic rules will be in the focus during the second half. Emphasis is taken on solving of the problems, on the possibilities and tools of environmental protection. Understanding the input and output methods of pollution reduction and the basic coherences of technological interventions. The role and novelty of the focused subject. The conferences organized by the United Nations. Giving history of Hungarian environmental protection. The law of LIII (1995). The process of air pollution in detailed. Types (local, regional and global scaled) and sources of fair pollution and their characterization. The transmission process. Decrease in harmful effect of garbage. The re-cycling of wastes for raw materials or energy sources. Way leading to make harmless the non re-usable wastes. Water a revolving prime mover under continuous circulation. Emissions mostly from human activities that are responsible for the damages caused on soils and not soil surfaces. Organization of processes that could declines the damages. Frames of the law.

Required reading materials

Hanaki, K.: Urban Environmental Management and technology

1st.. Springer Publish., 2008. ISBN: 9784431783978

Jorgensen, S. E.: Studies in Environmental Science Principles of environmental science and technology

14th.2011. ISBN: 9780080874739

Marinova, D.-Annandale, D.-Phillimore, J.: The International Handbook on Environmental Technology Management

Massachusetts, 2006. ISBN: 9781840646870

Krishnamoorthy, B.: PHI Learning Pvt. Ltd. Environmental Management

New Delhi, 2005. ISBN: 9781840646870

Gottlieb, D. W.: Environmental technology resources: handbook.

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Lewis Publishers, 2003. ISBN: 9781566705660

*Juhász, Cs.-Szöllösi, N.: Environmental and quality management elektronikus tananyag.*2011.

Subject: **WATER MANAGEMENT I.**

Year, Semester: 1st year/2nd semester

Lecture: **2**

Practical: **1**

Requirements

Course content: Review of technological practices, activities of water management concerning agriculture and environmental management. Review of theoretical knowledge and exercises in practice. Students will be qualified for the application of the Water management I. principles in environmental management and/or agriculture.

Required reading materials

Uhlig, U.: Current Issues of Water Management.

InTech Published, 2011. ISBN: 9789533074139

Kumar M. D., Sivamohan M.V.K., Bassai N.: Water Management, Food Security and Sustainable Agriculture in Developing Economies (Earthscan Studies in water resource Management)

Routledge, 2012. ISBN: 9780415624077

Lstiburek, J.: Water Mangement Guide.

Building Science Press., 2006. ISBN: 9780975512753

Bastasch, R.: The Oregon Water Handbook: A Guide to Water and Water Management

Oregon State University Press., 2006. ISBN: 9780870711817

Scelwald-van der Kley, A. J. M., reijerkerk, L.: Water: A way of life: Sustainable water management in a cultural context

1st. CRC Press., 2009. ISBN: 9780415551045

Department of Animal Husbandry

Subject: **AGRICULTURAL PRACTICE III.**

Year, Semester: 2nd year/1st semester

Practical: **40**

Requirements

Course content: The student will get to know and practice the fundamental working procedures of the animal breeding for various species. Different technologies will be introduced and they will learn the conditions of work organization. The working table of blue-collar workers and logic of work organization will also be shown for the students. They will know the different storage system of feeds, forages and litters. They will co-operate in the transportation of animals. They can learn the constant work discipline, the continuous process line of animal product production and how the proper amount of working demand can be satisfied.

Subject: **FEEDING FOR ANIMALS**

Year, Semester: 2nd year/1st semester

Lecture: **2**

Practical: **2**

Requirements

Course content:

The students have knowledge about the base of nutrition. We learn about the different digestion apparatus, the crude protein, fat, fiber starch vitamins and mineral elements, and the end of the semester get acquainted with some feed conservation methods.

Required reading materials

McDonald, P., R.A.Edwards, J.F.D.Greenhalgh, C.A. morgan: Animal nutrition
Pearson education, Limited, Harlow, UK., 2002.

Kellems, R.O. and Church, C.D.: Livestock feeds and feeding
Prentice Hall USA., 2010.

Miller W.J.: Animal feeding and nutrition
Academic Press USA, 1979.

Fekete, S. Gy. (Ed.): Veterinary Nutrition and Dietetics. Foundation for the Hungarian Veterinary science
Budapest, Hungary, 2008.

Department of Landscape Ecology

Subject: **CROP PRODUCTION I.**

Year, Semester: 2nd year/1st semester

Lecture: **2**

Practical: **1**

Requirements

Crop Production I.

Hours per week: lecture+practice 2+1

Credit: 4

Assessment: exam

Course coordinator: Dr. Csajbók József, assistant professor, PhD

Course content: Acquirement of practical knowledge of plant production and formation of a theoretical basis for it. Cognition of the biological, ecological and agrotechnical factors of plant production and interactive application of them in practice. Acquirement of practical knowledge of techniques for growing major field crops in Hungary.

Thematic plan of course:

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.

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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.

Required reading materials

- Antal J. (szerk.): Növénytermesztés I.*
Mezőgazda Kiadó, Bp., 2005. ISBN: 9632862058
- Antal J. (szerk.): Növénytermesztés II.*
Mezőgazda Kiadó, Bp., 2005. ISBN: 9632862066
- Pepó P. (szerk.): Növénytermesztési Praktikum I.*
Debreceni Egyetem AMTC, 2008. ISBN: 978963973227
- Pepó P. (szerk.): Növénytermesztési Praktikum II.*
Debreceni Egyetem AMTC, 2008. ISBN: 9789639732285
- Pepó P. (szerk.): Növénytermesztési Praktikum III.*
Debreceni Egyetem AMTC, 2008. ISBN: 9789639732292

Faculty of Economics and Business

Subject: **ECONOMIC SCIENCES I.**

Year, Semester: 2nd year/1st semester

Lecture: 4

Requirements

Course content: The aim of the subject is to make the students get acquainted with the basic theoretical and practical economic knowledge (Microeconomics, Macroeconomics, Agricultural Economics and European Union Studies) for student, which could help them in the following work.

Thematic plan of course:

1. Basic economic theory
2. Demand function and Supply function
3. Consumption behavior
4. Production function, resources
5. Production cost in the short run and in the long run
6. Perfect Competition
7. Monopoly, Price Discrimination
8. Externalities
9. Introduction of the macroeconomics
10. SNA (GDP, GNI, GNDI)
11. Labor market
12. Goods market
13. Money market
14. Financial policy
15. Monetary policy

1. Output of Hungarian agriculture
2. Farm structure
3. Land use
4. Crop production
5. Animal production
6. Agricultural products
7. Employment in Agriculture
8. Basic information about EU
9. EU law, treaties
10. Institutions and bodies
11. Life in the EU
12. EU policies
13. Financed support
14. Common Agricultural Policy (CAP)
15. Rural Development

Required reading materials

Solt Katalin: Makroökonómia

TRI-Mester Kiadó, 2001.

Solt Katalin: Mikroökonómia

TRI-Mester Kiadó, 2001.

Bock Gyula: Mikroökonómiai feladatok

TRI-Mester Kiadó, 2001.

*Bauerné Gáthy Andrea-Odor Kinga-Popovics Péter (szerk.): Mikroökonómia feladatgyűjtemény-
Alapszint*

2009.

Institute for Land Utilisation, Technology and Regional Development

Subject: **AGRICULTURAL MACHINERY**

Year, Semester: 2nd year/1st semester

Lecture: **2**

Practical: **2**

Requirements

Thematic plan of course:

1. The cereal harvester
2. Machines of maize harvesting
3. Machines of root-crop harvesting
4. Harvesting of rough fodder I. (reapers and mowers)
5. Machines of swath management, swathers
6. Harvesting of rough fodder II
7. Machines of truss management and moving
8. Chopping machines

CHAPTER 10

9. Silage production (vertical and horizontal silos).
10. Alternative silo solutions
11. Forage mixing facility
12. Preparation and distribution (feeding, watering) of fodder of cattle.
13. Mechanisation of milking
14. Automatisatation possibilities of milking
15. Machines of milk management
16. Machines and equipment of pig keeping
17. Equipment of poultry keeping
18. equipment of sheep keeping

Required reading materials

Szendrő Péter: Mezőgazdasági géptan

ISBN: 9639121177

Szendrő Péter: Példák mezőgazdasági géptanból

ISBN: 9633562066

Árvai András: Az állattartás épületei és gépei

ISBN: 6939185027

Subject: **LAND USE AND REGIONAL DEVELOPMENT**

Year, Semester: 2nd year/1st semester

Lecture: **2**

Practical: **2**

Requirements

Course content: Students should acquire the knowledge needed for the maintenance and improvement of soil fertility, as well as the reasonable usage of energies that can be incorporated into plough-land cultivation with soil as an intermediating factor. Students will be qualified for the application of the Land use and regional development principles in environmental management and in agriculture.

Required reading materials

Farkas, Cs., Gyuricza, Cs., László, P., Birkás, M.: Study of the influence of soil tillage on soil water regime

Catena Verlag, Reiskirchen, 2000.

Birkás, M.: Environmentally-Sound Adaptable Tillage.

Akadémiai Kiadó, Bp., 2008. ISBN: 9789630586313

Morgan, R.P.C.: Soil Erosion and Conservation

Longman Kiadó, London, 1995.

Schwab, G.O., Fangmeier, D.D., Elliot, W.J., Frevert, K.R.: Soil and Water Conservation Engineering

John Wiley&Sons, 1993.

Bouman B.A.M.;Jansen, H.G.P.; Schipper, R.A.;Hengsdijk, H.;Nieuwenhuyse, A. (Szerk.9: Tools for Land Use Analysis on Different Scales

Kluwer academic Publishers, 2000. ISBN: 9780792364795

Institute of Agricultural Chemistry and Soil Science

Subject: **AGROCHEMISTRY**

Year, Semester: 2nd year/1st semester

Lecture: **2**

Practical: **1**

Requirements

Course content: The aim of the sustainable nutrient management, the potential negative environmental effects of the chemical fertilizers. The chemical composition of plants (water and dry matter contents). The criteria and classification of plant nutrients. The nutrient uptake by plant roots. Nutrient uptake by leaves. Influencing factors. The water uptake of plants, water use efficiency, transpiration. Influencing factors. The effects of nutrient supply on the quantity and quality of plants. Nutrient forms in the soil, the composition of the soil solution. The movement of nutrients in the soil. The acidity of the soil. The redoxpotential of the soil. The cation absorption, the anion absorption and their importance, necessity. The nitrogen in the soil, nitrogen uptake by plants, the role of nitrogen in the plants, chemical fertilizers containing nitrogen, nitrogen manuring. The phosphorus in the soil, phosphorus uptake by plants, the role of phosphorus in the plants, chemical fertilizers containing phosphorus, phosphorus manuring. The potassium in the soil, potassium uptake by plants, the role of potassium in the plants, chemical fertilizers containing potassium, potassium manuring. Complex and mixed fertilizers. Micronutrients in the soil, their uptake by plants, their role in the plants. Micronutrients in manure. Formation of livestock manure, its quality, usage. Slurry. Dung water, Other organic fertilizers. Soil reclamation, lime manure. The judgement of the nutrient supply of soil with biological and chemical methods. Fertilizer advice

Required reading materials

K. Mengel and E. A. Kirkby: Principles of plant nutrition

International Potash Institute, Bern, Switzerland, 1987. ISBN: 3906535037

Subject: **PROJECT WORK I.**

Year, Semester: 2nd year/1st semester

Practical: **4**

Requirements

Course content: During practices the physical, chemical and microbial characteristics of various soils can be known by the students.

This component is in preparation for the final examination, and will take the form of a case study (minimum length 25 pages), presented in a standardized report format, as outlined below:

1. Title page
2. Problem identification & analysis
3. Literary processing

The subject of the case study must be agreed on with the responsible course instructor.

CHAPTER 10

Subject: **SOIL SCIENCE**

Year, Semester: 2nd year/1st semester

Lecture: **2**

Practical: **1**

Requirements

Course content: The soil is one of the most important natural resources. The subject shows the constitutions and the formation processes of soils. The concept and functions of soil. Soil forming factors. Soil forming rocks and minerals and their weathering. This subject deals with evaluation of physical and chemical characteristics of soils. The organic matter of the soil. The formation of humic substances. The role of humus formation and soil fertility maintenance. Granulometric composition of the soil and texture classes according to their groupings. Colloids in the soil. Processes on the surface of the colloids. Soil acidity and alkalinity. The pH of the soil. The forms of soil acidification. The development of soil structure, morphological and agronomic evaluation of soil structure. The bulk density and its definition. Spore system of soil. The soil water regime system. Formula moisture in the soil. The water movement in the soil. The air and soil temperature and nutrient management. At the second part of semester the Hungarian soils will be shown. Principles and methods of soil classification. Recent efforts of soil classification. The classification of Hungarian soils. The main types. Skeleton and litomorf soil types. Characteristics of the Central and South Eastern European Brown Forest soils. Classification of Chernozem soils. Unfavourable soil properties and formation of alkaline soils. Types of Meadow soils. Bog soils. Marsh and floodplain forest soils' origins and types. Alluvial and slope alluvium soils. Geography of Hungary's soil. The erosion and deflation factors, forms of soil degradation stages. Soil protection. About soil pollution.

During practices the physical and chemical features of various soils can be known by the students.

Required reading materials

Brady, N.-Weil, R.: The Nature and properties of Soils.

Prentice-Hall, 1996.

Filep Gy.: Talajtani alapismeretek I-II.

DATE egyetemi jegyzetek, 1999.

Filep Gy.: Talajvizsgálat

egyetemi jegyzet, 1988.

Filep Gy.: Soil Chemistry, processes and constituents.

Akadémiai Kiadó, Bp., 1995.

Paul, A. D.: Soil microbiology, Ecology and Biochemistry

Acad. Press Elsevier, 2007.

Agricultural Laboratory Centre

Subject: **AGROECOLOGY**

Year, Semester: 2nd year/2nd semester

Lecture: **2**

Requirements

Course content:

Thematic plan of course:

1. Information and its usage in agricultural meteorology, Atmospheric characteristics
2. Solar energy, physical characteristics, and solar climate
3. Air movement structure, wind in the canopy, wind energy
4. Heat management of different soils. Temperature profile in the soil and atmosphere
5. Air humidity, expression types, annual and daily distribution of air humidity
6. Soil moisture, expression types, time and spatial distribution of soil moisture
7. Precipitation types, annual distribution of Hungary
8. Evaporation, potential evaporation
9. Micrometeorology, factors and characteristics of microclimate
10. Atmosphere-vegetation-soil interaction
11. Water resources, irrigation and drainage, edaphic measurement
12. Measurement of the exchange heat and mass between the atmosphere and a crop
13. Management and analysis of agroclimate
14. Crop requirements, temperature and crop development

Required reading materials

Ahrens, C.D. : Meteorology Today: An introduction to weather, Climate and the Environment
7th. Pacific Grove Brooks,

Hogg, W.H.: The use of climatic information in the classification of agricultural horticultural land
1974.

John F. Griffiths: Handbook of agricultural meteorology
Oxford University Press, 1994.

Rosemberg, N. J., Blad, B. L. & Verma, S. B.: Microclimate, The Biological Environment
2nd. New York, John Wiley & Sons,

Subject: **ECONOMIC SCIENCES II.**

Year, Semester: 2nd year/2nd semester

Lecture: **4**

Practical: **1**

Requirements

Course content: The main objective of the subject is to make the students get acquainted with the economic aspects of the agricultural entrepreneurs. They have to know the basic economic categories (production value, production cost, profit, efficiency), the economic aspects of resources and functional activities of farms and basic economic calculations of profitability, prime cost, efficiency, and the practice of future and present value calculation.

Thematic plan of course:

1. Basic economic categories. Production value
2. Production cost
3. Profit, profitability, efficiency and its categories
4. Resources of agricultural production. Capital and its characteristics, use and source of capital
5. Fixed assets, investments, use of fixed assets in agriculture
6. Land and its role and use
7. Current assets, tasks of the use of current assets in agriculture

CHAPTER 10

8. Human resource in agricultural production. Territories and tasks of human resource management
9. Forms of entrepreneurs in agriculture
10. Economic aspects of innovation
11. Economic aspects of machinery in agricultural production
12. Economic aspects of fertilization
13. Economic aspects of irrigation
14. Economic aspects of plant protection
15. Economy of scales in agricultural production

Required reading materials

Ernő Pfau-András Nábrádi: Production factors and resources of the agricultural entrepreneurs (lecture notes)

Debrecen, 2007.

Ernő Pfau-László Posta: Basic economic categories (lecture notes)

Debrecen, 2007.

Ernő Pfau-Gyula Széles: Agricultural economy II.

Budapest, 2001.

E. N. Castle-M. H. Becker-A. G. Nelson: Farm business management

Budapest, 1992.

Attila Chikán: Economy of entrepreneurs

Budapest, 1992.

Department of Animal Husbandry

Subject: **AGRICULTURAL PRACTICE IV.**

Year, Semester: 2nd year/2nd semester

Practical: **40**

Requirements

Course content: The student will get to know and practice the fundamental working procedures of the animal breeding for various species. Different technologies will be introduced and they will learn the conditions of work organization. The working table of blue-collar workers and logic of work organization will also be shown for the students. They will know the different storage system of feeds, forages and litters. They will co-operate in the transportation of animals. They can learn the constant work discipline, the continuous process line of animal product production and how the proper amount of working demand can be satisfied.

Subject: **ANIMAL HUSBANDRY I.**

Year, Semester: 2nd year/2nd semester

Lecture: **2**

Practical: **1**

Requirements

Course content: Animal Husbandry II. involves the study of livestock housing, nutrition, breeding aspects, breeds. Livestock species are ruminants (cattle and sheep), pig and poultry. Main aspects of

subject: Trends of animal production in the world. Importance of pig, cattle, sheep, chicken, turkey production, housing, hybrids and breeds, quantitative traits. Dual and tri-purpose breeds. Animal products as output of primary industry. Students, complete the requirement of the subject will have an overview of modern, intensive and extensive animal production systems as well. One will have the knowledge to evaluate the operation of an existing farm. Requirements of animals as nutrition, environment, their physiological aspects will be involved in their course.

Required reading materials

Richard A. Battaglia : Handbook of Livestock Management

4th. Prentice Hall USA.,

James R. Gillespie, Frank Flanders: Modern Livestock&Poultry Production

8th. Delmar Cengage Learning, 2009.

Robert E. Taylor, Tom G. Field: Scientific Farm Animal Production

10th. Prentice Hall USA., 2011.

Department of Landscape Ecology

Subject: **CROP PRODUCTION II.**

Year, Semester: 2nd year/2nd semester

Lecture: **2**

Practical: **1**

Requirements

Course content: Acquisition of practical knowledge of plant production and formation of a theoretical basis for it. Cognition of the biological, ecological and agrotechnical factors of plant production and interactive application of them in practice. Acquisition of practical knowledge of techniques for growing major field crops in Hungary.

Required reading materials

Antal J. (szerk.): Növénytermesztés I.

Mezőgazda Kiadó, Bp., 2005. ISBN: 9632862058

Antal J. (szerk.): Növénytermesztés II.

Mezőgazda Kiadó, Bp., 2005. ISBN: 9632862066

Pepó P. (szerk.): Növénytermesztési Praktikum I.

Debreceni Egyetem AMTC, 2008. ISBN: 978963973227

Pepó P. (szerk.): Növénytermesztési Praktikum II.

Debreceni Egyetem AMTC, 2008. ISBN: 9789639732285

Pepó P. (szerk.): Növénytermesztési Praktikum III.

Debreceni Egyetem AMTC, 2008. ISBN: 9789639732292

Institute of Agricultural Chemistry and Soil Science

Subject: **PROJECT WORK II.**

Year, Semester: 2nd year/2nd semester

Practical: 4

Requirements

Course content: During practices the physical, chemical and microbial features of various soils can be known by the students.

This component is in preparation for the final examination, and will take the form of a case study (minimum length 25 pages), presented in a standardized report format, as outlined below:

1. Statement of major problems
2. Elaborate the material and methodes
2. Perform of necessary laboratories examinations
3. Literary processing

The subject of the case study must be agreed on with the responsible course instructor.

Institute of Plant Protection

Subject: **PLANT PATHOLOGY**

Year, Semester: 2nd year/2nd semester

Lecture: 1

Practical: 1

Institute of Water and Environmental Management

Subject: **WATER MANAGEMENT II.**

Year, Semester: 2nd year/2nd semester

Lecture: 2

Practical: 1

Requirements

Course content: This course reviews the water management in practice, including the drainage, irrigation systems, channel scaling and surplus water management. Students will be qualified for the application of the Water management II. principles in environmental management and/or agriculture.

Required reading materials

Uhlig, U.: Current Issues of Water Management.

InTech Published, 2011. ISBN: 9789533074139

Kumar M. D., Sivamohan M.V.K., Bassai N.: Water Management, Food Security and Sustainable Agriculture in Developing Economies (Earthscan Studies in water resource Management)

Routledge, 2012. ISBN: 9780415624077

Tanji, K. K., Kielen, N. C.: Agricultural Drainage Water Management in Arid and Semi-arid Areas

2006. ISBN: 9788172334567

Chaudhry, M. H.: Open-Channel Flow.

2nd. Springer, ISBN: 9780387301747

Majumdar, D. K.: Irrigation Water Management: Principles and Practice

PHI Learning Private Limited, 2012. ISBN: 9788120317297

Department of Animal Husbandry

Subject: **AGRICULTURAL PRACTICE V.**

Year, Semester: 3rd year/1st semester

Practical: **40**

Requirements

Course content: The student will get to know and practice the fundamental working procedures of the animal breeding for various species. Different technologies will be introduced and they will learn the conditions of work organization. The working table of blue-collar workers and logic of work organization will also be shown for the students. They will know the different storage system of feeds, forages and litters. They will co-operate in the transportation of animals. They can learn the constant work discipline, the continuous process line of animal product production and how the proper amount of working demand can be satisfied.

Subject: **ANIMAL HUSBANDRY II.**

Year, Semester: 3rd year/1st semester

Lecture: **2**

Practical: **1**

Requirements

Course content: Animal Husbandry II. involves the study of livestock housing, nutrition, breeding aspects, breeds. Livestock species are ruminants (cattle and sheep), pig and poultry. Main aspects of subject: Trends of animal production in the world. Importance of pig, cattle, sheep, chicken, turkey production, housing, hybrids and breeds, quantitative traits. Dual and tri-purpose breeds. Animal products as output of primary industry. Students, complete the requirement of the subject will have an overview of modern, intensive and extensive animal production systems as well. One will have the knowledge to evaluate the operation of an existing farm. Requirements of animals as nutrition, environment, their physiological aspects will be involved in their course.

Faculty of Economics and Business

Subject: **ECONOMIC SCIENCES III.**

Year, Semester: 3rd year/1st semester

Lecture: 4

Requirements

Course content: The most important aim is students possess those basic knowledge which are in strong connection with organization and logistics, business economic and marketing, extension areas of specialty.

Thematic plan of lectures:

1. Organization and logistics – Operational strategy
2. Organization and logistics – Products and services
3. Organization and logistics – Processions and technologies
4. Management – The concept of management, its evolution and development
5. Management – Organizational forms and group-management
6. Management – Communication and information management
7. Management – Decision and decision making
8. Marketing – Introduction, segmentation
9. Marketing – Consumer and organizational attitude
10. Marketing – Product and price policy
11. Marketing – Distribution and promotion
12. Extension – The extension system
13. Extension – The extension register system
14. Extension – Changing the extension system

Required reading materials

Roóz J.: Vezetésmódszertan

Perfekt Kiadó, budapest, 2006.

Bakacsi Gy.: Szevezeti magatartás, vezetés

Aula Kiadó, 2007.

Bauer A.-Berács J.: Bevezetés a marketingbe

2006.

Hajós-Pakurár-Berde: Szervezés és logisztika notes

2007.

Szegedi-Prezenszki: Logisztika-menedszment

Kossuth Könyvkiadó, 2003.

Dr. Kozári József: Szaktanácsadás a mezőgazdaságtanban

Dinasztia Kiadó, 2000.

Alan w. van den Ban-H. S. Hawkins: Mezőgazdasági szaktanácsadás

Mezőgazda Kiadó, Bp., 1996.

Subject: **STATISTICS**

Year, Semester: 3rd year/1st semester

Lecture: **1**

Practical: **1**

Requirements

Course content:

Thematic plan of lectures:

1. The aim and role of Statistics, basic concepts. Probability, independence, criterion, population, sample.
2. Random sampling, systematic error, parameter. Randomising. Collecting data, sampling methods
3. Organizing data into a database, database management systems, characteristics of data, levels of measurement. Data transformation procedures: sort cases, select cases, aggregate data, merge files.
4. Determining the characteristic values of data belonging to different levels of measurement. Mean, variance, standard deviation.
5. Median, range, geometric mean, harmonic mean, variation coefficient. Standard error of mean. Confidence intervals. Reports, pivot diagrams, Data portrayal, graphs and other diagrams.
6. Normal distribution as a model. Cumulative probability and density function. Standard values and regularities of normal distribution. Tests of normal distribution.
7. Standard distribution, t- distribution,
8. F- distribution, Chi-square distribution.
9. Hypothesis analyses. Compare means: u-test, one sample t-test, independent-samples t-test, paired-samples t-test, one-way ANOVA.
10. General linear models (GLM) 1. Concept. One-way models
11. General linear models (GLM) 2. Multifactorial (two and three factors) models
12. Post hoc multiple comparisons for observed means.
13. Correlation analyses. Bivariate correlations. Applicability conditions.
14. Regression analysis, concept, bivariate linear regression. Multiple linear regression, technics of initiating independent variables. Multicollinearity diagnostics, problem.

Required reading materials

Chris Spatz: Basic Statistics: Tales of Distributions

10th. Cengage Advantage Books , 2010. ISBN: 9780495808916

Charles Henry Brase and Corinne Pellillo Brase : Understanding Basic Statistics

5. Cengage Advantage Books, 2008. ISBN: 9780547132495

Rachad antonius: Interpreting quantitative data with SPSS,

Sage Publications Inc., 2003. ISBN: 0761973982

Andy Field: Discovering Statistics Using SPSS

Sage Publications Inc., 2009. ISBN: 9781847879066

Institute of Agricultural Chemistry and Soil Science

Subject: **PROJECT WORK III.**

Year, Semester: 3rd year/1st semester

Practical: 4

Requirements

Course content: During practices the physical, chemical and microbial features of various soils can be known by the students.

This component is in preparation for the final examination, and will take the form of a case study (minimum length 25 pages), presented in a standardized report format, as outlined below:

1. Processing of experimental results
2. Statistical analyses
3. Disputation of results
4. Deduction of inferences

Institute of Horticulture

Subject: **HORTICULTURE II.**

Year, Semester: 3rd year/1st semester

Lecture: 1

Practical: 1

Requirements

Course content: Knowledge the modern growing technology of more considerable vegetable plant, ability to choice the optimal growing place, skill to define the factors which determine the quality and their application in the growing. The students know the raw material needs of processing industry and the fresh market and are capable of the selection of proper technology and varieties.

Thematic plan of lectures:

1. The role of the vegetables in the nourishment; the situation of the growing of vegetables and its peculiarities;
2. The grouping of vegetables according to a heat claim and the applied propagation methods.
3. Characterisation and growing of the lettuce and horseradishes.
4. The characterisation of root vegetables - the growing of the carrot and parsley.
5. The characterisation of beetroot, parsnip, celery and his growing.
6. The general characterisation of the onion, growing from seeds (one-year growing method) and from sets (two year method).
7. The characterisation of garlic and green beans and their growing technology.
8. The environmental claim of a sugar pea, different types, growing.
9. The characterisation of cucumber and his growing methods.
10. The environmental claim of watermelon and muskmelon, their growing.
11. The environmental claim of a tomato and his growing.
12. The characterisation of sweet pepper, his claims and growing.
13. The characterisation of red pepper, peculiarities of growing and different post-harvest methods.
14. The environmental claim of sweet corn, special types and growing.
15. The environmental claim of cabbage, the peculiarities of its growing

Required reading materials

Sánchez, E. S.: Vegetable Gardening

The Pennsylvania State University, 2010.

Ric Bessin, R. : Vegetable Production Guide for Commercial Growers.

University of Kentucky College of Agriculture, Lexington, 2012.

Institute of Plant Protection

Subject: **AGRICULTURAL ENTOMOLOGY**

Year, Semester: 3rd year/1st semester

Lecture: **1**

Practical: **1**

Requirements

Course content: The Agricultural BSc degree holder should be able to know (theoretically and practically) and recognize the most important animal pest species of the characteristic crops in Central Europe. This knowledge consists of the morphology, physiology, development, taxonomy, ecology of the pests as well as their damage, yield loss and damage symptoms. He must know also the ecological and biological principles of the sustainable control methods.

Thematic plan of lectures:

1. Introduction to the Agricultural Entomology (notion, importance, objective and connections of the subject). The evolution of pests. The damage and symptoms. Taxonomy. Insect morphology and anatomy.
2. Embryonic and post-embryonic development of insects. Insect larval and pupal forms. Insect diapause. Ecological principles.
3. Individual ecology, population dynamics. General knowledge of the pest control (physical, chemical, biological, biotechnological, integrated).
4. Pests of cereals, maize and potato. Principles of the control.
5. Pests of sugar beet and alfalfa. Principles of the control.
6. Pests of leguminous crops, sunflower, the stored products, cabbage and rape. Principles of the control.
7. Pests of onions, tobacco, tomato and green pepper. Pests of fruit trees and the grape vine. Principles of the control.

Thematic plan of practical classes:

1. Importance, morphology, life history, damage and symptoms of nematodes and snails. Insect morphology and anatomy. Post-embryonic insect development, insect larvae.
2. Importance, morphology, life history, damage and symptoms of Orthoptera, Thysanoptera, Heteroptera and Homoptera.
3. Importance, morphology, life history, damage and symptoms of Heteroptera, Homoptera and Coleoptera I.
4. Importance, morphology, life history, damage and symptoms of Coleoptera II and III.
5. Importance, morphology, life history, damage and symptoms of Lepidoptera I and II.
6. Importance, morphology, life history, damage and symptoms of Hymenoptera and Diptera.
7. Importance, morphology, life history, damage and symptoms of mites. Natural enemies of animal pests..

Agricultural Laboratory Centre

Subject: **FARM BUSINESS MANAGEMENT**

Year, Semester: 3rd year/2nd semester

Lecture: **2**

Requirements

Course content: The subject goal is to get students acquainted with external environment of a business and its evaluation philosophy and methodology. To have the students acquired the various management techniques and their tools to manage business efficiency. To provide them with knowledge to identify right business form and the separate sections of production of goods such as capital use and its sources, management of fixed, current and liquid assets. The subject clarifies the role of the human resource management and its tools in a business life. The subject allows them to acquire the basics of specific management tools of farm business such as planning and controlling.

Thematic plan of lectures:

1. Management and decision making, organizing management information
2. The balance sheet and the income statement and their analysis
3. Economic principles-choosing production levels, and input-output combinations
4. Investment analysis
5. Capital, depreciation and asset valuation
6. Land-control and use
7. Human resource management
8. Machinery management
9. Farm business organization and transfer
10. Enterprise budgeting
11. Partial budgeting
12. Whole-farm planning
13. Cash flow budgeting
14. Farm business analysis
15. Managing risk and uncertainty
- 16.

Required reading materials

Ronald D. Kay-William M. Edwards-Patricia Duffy: Farm management

6. McGraw-Hill International Edition, 2008. ISBN: 9780071259538

A E Bruce Fielding: Farm management, A Handbook for Farm Pupils

Nabu, 2010. ISBN: 1171569394

Kent D. Olson: Farm management, Principles and Strategies

Iowa State University Press, 2003. ISBN: 9780813804187

Subject: **GRASSLAND MANAGEMENT**

Year, Semester: 3rd year/2nd semester

Lecture: **1**

Practical: **1**

Requirements

Course content: The subject presents the basic skills on grasslands, on the effect of natural conditions (ecology) on grasslands, on the basic elements of successful grassland production (inputs,

renovation works etc.), on the formation of grassland yields, yield quantity and quality, describe the main uses of grasslands use (grazing, conservation), the use of grasslands for amenity purposes.

Required reading materials

W. Holmes : Grass /its production and utilization/

2nd. Balckwell Scientific Publications, Oxford , 1989. ISBN: 0632024615

J. Frame: Improved Grassland Management

Farming Press, Ipswich, UK, 1992. ISBN: 0852362463

W. F. Wedin et al (editors): Grassland /Quitness and Strength for a New American Agriculture/

American Society of Agronomy, Inc, 2009. ISBN: 9780891181712

Subject: **REGULATION AND ADMINISTRATION OF AGRICULTURE**

Year, Semester: 3rd year/2nd semester

Lecture: **2**

Requirements

Thematic plan of lectures:

1. Prelude, basic concepts of law, hierarchy of the legal system, legislators.
2. Fundamentals of Civil Law and Civil Procedure Law, subjectives of the legal action, the hungairan judicial system, orders, the lawsuit process.
3. European Union Law, treaties, legislatures, supremacy, internal market and free movement, Common Agricultural Policy.
4. The history of the development of agricultural law in Hungary.
5. Fundamental of substantive law I.; property, protection of property, asset, immovable estate.
6. Fundamental of substantive law II., original and derivative feature of ways of acquisition, overbuilt, use.
7. The Structure of Hungarian Soil Use, regulation, delimitation of acquisition of soil.
8. Special Rules of Acquisition, in the sylviculture, water management.
9. Regulation of Soil Use, contracts of soil use.
10. Agricultural Register, history, development, operative rules.
11. Regulation of Farmers' co-operation.
12. Regulation of the Food Chain.
13. Supports of Agriculture.
14. Public Body in the Agricultural and Rural Development.
15. Fundamentals of Labour Law

Required reading materials

László Fodor-Zoltán Mikó: Agricultural Law

Bíbor Publisher, 2000.

Robert P. Achenbach, Jr.: Agricultural Law

Matthew Bender publisher, ISBN: 9780820513034

Csilla Csák-Zoltán Nagy-István Olajos-Gábor Orosz-Ágnes Szabó-János Ede Szilágyi-Géza Török:

Agricultural Law. The Development of Agricultural Law in the EU

Novotni Publisher, 2010. ISBN: 9789639360532

Blackstone's EU Treaties&Legislation 2012-2013: Blackstone's EU Treaties&Legislation 2012-2013

Department of Animal Husbandry

Subject: **ANIMAL HEALTH**

Year, Semester: 3rd year/2nd semester

Lecture: **1**

Practical: **1**

Requirements

Course content:

Factors and circumstances, that can be a possible cause of disorders and outbreaking contagious diseases. Preventing - or managing - outbreaks of serious animal diseases, and in doing so support the farming industry, protect the welfare of farmed animals and safeguard public health from animal borne disease. Reviewing the most important viral, bacterial, parasitic diseases and some toxicosis.

Thematic plan of lectures:

1. Animal health, relationships with other disciplines.
2. Health and diseases/ illness. Factors affecting the outbreaking of an illness/ disease.
3. Pathogens. Terminology in epidemiology. Procession and outcome of a disease.
4. Institution regime in animal health.
5. Environment hygiene in animal breeding (projection of a farm, protection).
6. Fodder- hygiene
7. OIE listed diseases
8. Viral diseases.
9. Diseases caused by prions.
10. Bacterial diseases.
11. Fungal diseases.
12. Parasites, parasitic diseases.
13. Toxicosis.

Thematic plan of practical classes:

1. Handling of farm animals, accident- prevention.
2. General informations about illnesses/ diseases. Checking the health status, general symptoms.
3. Stable hygiene.
4. Decontamination, pest- control.
5. First aid in surgery and internal medicine. Administration of drugs.
6. Reproductive diseases, mastitis.
7. Parturition.

Required reading materials

Az állategészség-védelem alapjai

Mezőgazda Kiadó, Bp., 2009.

Állategészség-védelem

Mezőgazda Kiadó, Bp., ISBN: 9639359495

Állategészségtan

Mezőgazda Kiadó, Bp., 1995. ISBN: 9638439327

Állategészségtani gyakorlatok

Agrártud. Egy., Debrecen, 1998.

Department of Nature Conservation, Zoology and Game Management

Subject: **FOREST AND GAME MANAGEMENT**

Year, Semester: 3rd year/2nd semester

Lecture: **2**

Practical: **1**

Requirements

Course content: The main objective of the course is to give basic information on the priorities, characteristics and tasks of the Hungarian forest management, the main policies on forest economics and the structure of the forest administration. In the frame of this, students can learn the following pieces of factual knowledge: the priorities and criteria of the Hungarian forest management, financial and other resources provided by forest management, semi-natural forest management, plantation forestry, tasks and structure of the forest administration.

Required reading materials

Forest resources, forestry and wood management in Hungary

Central Agricultural Office, Budapest, 2011.

Mátyás Cs.: An Introduction to Forest Tree Improvement

University Press, Sopron, 1983.

Pommerening, A. Murphy, S. T.: A review of the history, definitions and methods of continuous cover forestry with special attention to afforestation and restocking.

Forestry, VOL. 77,

Rédei K.: Black locust growing in Hungary

FRI, Budapest, 2003.

Savill, P. at all: Plantation Silviculture in Europe

Oxford University Press, 1997.

Institute of Agricultural Chemistry and Soil Science

Subject: **PROJECT WORK IV.**

Year, Semester: 3rd year/2nd semester

Practical: **4**

Requirements

Course content: During practices the physical, chemical and microbial features of various soils can be known by the students.

This component is in preparation for the final examination, and will take the form of a case study (minimum length 25 pages), presented in a standardized report format, as outlined below:

1. Summary
2. Bibliography
3. Consultation

CHAPTER 10

The subject of the case study must be agreed on with the responsible course instructor.
Course represents student's own research, design and preparation of a professional case study.

Institute of Food Science

Subject: **QUALITY MANAGEMENT SYSTEM**

Year, Semester: 3rd year/2nd semester

Lecture: **2**

Requirements

Course content: Knowledge to be acquired: basic quality concepts, basics of quality assurance, good practices, HACCP, ISO standards (9000, 9001, 9004, 14001, 22000), BRC, IFS, TQM.

Developed competencies: development of quality approach, participation in quality assurance activities.

Required reading materials

Inteaz Ali: Food Quality Assurance

CRC Press., 2004.

Steve Crossley-Yamine Motarjemi: Food safety management tools

ILSI EUROPE, 2011.

M. van Schothorst: A simple guide to understanding and applying the HACCP concepts

ILSI EUROPE, 2004.

Györi Zoltán-Györiné Mile Irma: Minőségirányítás alapjai

Műszaki Könyvkiadó, 2001.

Veress Gábor: A minőségügy alapjai

Műszaki Könyvkiadó, 1999.

Veress Gábor, Birher Nándor, Nyilas Mihály: A minőségbiztosítás filozófiája

JEL Kiadó, 2005.

Institute of Plant Protection

Subject: **INTEGRATED PLANT PROTECTION**

Year, Semester: 3rd year/2nd semester

Lecture: **1**

Practical: **1**

Requirements

Course content:

I. Weed biology and weed control

Targets: Basic knowledge of weed biology. To study the most important weed species and weed control technologies in arabic plant cultures and fruits.

II. Integrated plant protection

Targets: To learn the most important principles of integrated plant- and fruit protection. To present the most important pests and pathogens of the important plant cultures as well as to study the basic

technologies (mechanical, agrotechnical, chemical, biological) against them.

Thematic plan of lectures:

1. Introduction. Most important weed species in Hungary and in the World.
2. Weed biology.
3. Agrotechnical, mechanical, biological methods in weed control.
4. Chemical weed control and integrated weed management.
5. Resistance against herbicides.
6. Weed management in arabic crops.
7. Weed management in vegetables and fruits.
8. Basic of integrated plant protection and plant protectional forecasting.
9. Integrated plant protection of cereals.
10. Integrated plant protection of sunflower and oilseed rape.
11. Integrated plant protection of pea, bean and alfa-alfa.
12. Integrated plant protection of vegetables (tomato, pepper, onion).
13. Integrated plant protection potato, tobacco and sugarbeet.
14. Integrated plant protection of apple and stone fruits.
15. Integrated plant protection of grapes.

Required reading materials

Radosevich S. R.-Holt J. S.: Weed Ecology and Vegetation Management
Wiley-Interscience publication, New York, 1994.

Glenn C. Klingman and Floyd M. Ashton: Weed Science
3. Wiley-Interscience publication, New York, 2004.

Edited by Naqui Springer: Diseases of Fruits and Vegetables
2004.

General Concepts in Integrated Pest and Disease Management
Edited by A Ciancio and K G Mukerji Springer, 2007.