UNIVERSITY OF DEBRECEN
Faculty of the Agricultural and Food Sciences and Environmental Management

DEBRECEN, HUNGARY

Agricultural Engineering BSc
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UNIVERSITY OF DEBRECEN

The history of the University and Debrecen

About Debrecen

With 205,000 inhabitants Debrecen is the second largest city in Hungary and the center of the North Great Plain Region. The Eastern gate of Europe, as Debrecen is often referred to, is also the seat of Hungarian Protestantism, and as such is often called the "Calvinist Rome". The numerous university faculties, colleges and professional schools have turned Debrecen into the country's most important educational center. More recently, the city's main focus is the development of its industrial park, and centers for knowledge management in information technology, nanotechnology, pharmacy and biotechnology. Summer is the time of festivals: thousands of people from other parts of Hungary as well as from abroad visit the famous Debrecen Flower Carnival, the Debrecen Jazz Days, the Béla Bartók International Choir Competition and the International Military Band Festival. The new Conference Center hosts professional and cultural programs. Week by week, many people support the city's most famous sport clubs, especially the football, handball and basketball teams. Those wishing to take a rest are welcome in the Great Forest, where the famous Debrecen Spa Bath and the Mediterranean Aquaticum are located.

Higher education in Debrecen

The history of Debrecen's higher education dates back to the 16th century. The Calvinist Reformed College, established in 1538, played a central role in education, teaching in the native language and spreading Hungarian culture in the region as well as in the whole country. The College was a sound base for the Hungarian Royal University, founded in 1912. Apart from the three academic faculties (arts, law, theology) a new faculty, the faculty of medicine was established, and the University soon became one of the regional citadels of Hungarian higher education.

Today the University of Debrecen is classified as a “University of National Excellence” and offers the highest number of academic programs in the country, hence it is one of the best universities in Hungary. Its reputation is a result of its quality training, research activities and the numerous training programs in different fields of science and engineering in English.

With 14 faculties and a student body of almost 30,000, of which about 3700 are international students, the University of Debrecen is one of the largest institutions of higher education in Hungary.
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.
THE ORGANIZATIONAL STRUCTURE OF THE UNIVERSITY

RECTOR OF THE UNIVERSITY OF DEBRECEN

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COORDINATING CENTER FOR INTERNATIONAL EDUCATION

........

Faculty of Agricultural and Food Sciences and Environmental Management

Dean: Dr. habil István Komlósi

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Katalin Dr. Fürjné Rádi

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**Academic Registrar:** Dr. Istvánné Kovács
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E-mail: ktunde@agr.unideb.hu

Gizella Guthyné Kerekes
Mónika Pintyéné Bátori
Zsuzsanna Házi
László Lévai
THE DEPARTMENTS OF THE FACULTY

Institute of Agricultural Chemistry and Soil Science

Head of the Institute: Prof. Dr. habil. János Kátai

Associate professor:
Dr. habil. Imre Vágó
Dr. Andrea Balláné Kovács
Dr. Mária Dr. Micskeiné Csubák

Assistant professor:
Dr. Sándorné Kincses
Dr. Rita Erdeiné Kremper
Dr. Zsolt Sándor

Research assistant:
Dr. Magdolna Tállai

Secretary
Gizella Szász

Institute of Animal Science, Biotechnology and Nature Conservation

Department of Animal Husbandry

Head of the Department: Prof. Dr. István Komlósi

Professor emeritus: Dr. Sándor Mihók

Associate professor:
Dr. Béla Béri
Dr. László Stündl
Dr. Gabriella Novotniné Dankó
Dr. József Prokisch
Dr. Károly Magyar
Assistant professor
Dr. János Posta
Dr. Levente Czeglédi
Dr. Péter Bársony
Dr. Anna Pécsi

Assistant lecturer:
Dr. Nóra Dr. Pálffyné Vass

Technical assistant:
Babka Beáta
Sztrik Attila
Gulyás Gabriella

Secretary:
Károlyné Kiss
Marianna Korcsmárosné Varga
Ágnes Gere
Anikó Nagy
Sándor Boros

**Department of Nature Conservation, Zoology and Game Management**

Head of the Department: Dr. habil. Lajos Juhász

Professor:
Dr. Károly Rédei

Assistant professor:
Dr. Lajos Kozák
Dr. László Szendrei
Dr. Péter Gyüre
Assistant research fellow:
Dr. László Kövér

Technical assistant
Norbert Tóth

**Department of Animal Nutrition and Food Biotechnology**
Head of the Department: Prof. Dr. László Babinszky

Associate professor:
Dr. Csaba Szabó

Senior lecturer.
Dr. Judit Dr. Gálné Remenyik

**Animal Genetics Laboratory**
Head of the Department: Prof. Dr. András Jávor

Professor: Dr. András Kovács

Senior research fellow: Dr. Szilvia Kusza

Assistant lecturer: Zsófia Dr. Rózsáné Dr. Várszegi

**Institute of Food Science**
Head of the Institute: Prof. Dr. Béla Róbert Kovács

Professor:
Dr. Béla Róbert Kovács

Dr. János Csapó

Associate professor:
Dr. Erzsébet Karaffa

Dr. Péter Sipos

Assistant professor:
Dr. Ferenc Árpád Peles
Dr. Nikolett Czipa
Assistant lecturer:
Dr. Diána Ungai
Dávid Andrási
Technical assistant:
Andrea Tóthné Bogárdi
Éva Bacskaíné Bódi
Secretary:
Tünde Simon

Institute for Land Utilisation, Technology and Regional Development
Head of the Institute: Dr. János Nagy, DSc
Professor:
Dr. Béla Baranyi, DSc
Dr. Gyula Horváth

Associate professor:
Dr. Zoltán Hagymássy
Dr. Endre Harsányi
Dr. Tamás Rátonyi

Assistant professor:
Dr. Adrienn Széles
Dr. András Vántus
Dr. Andorkó Imre
Senior research fellow:
Dr. Attila Csaba Dobos

Secretary:
Zsuzsanna Dorogi
Sándorné Széles

**Institute of Horticulture**

Head of the Institute: Prof. Dr. habil. Imre Holb

Associate professor: Dr. habil Mária Takácsné Hájos

Assistant professor: Dr. Nándor Rakonczás

Assistant lecturer:
Péter Dremák
Ádám Csihon

Assistant research fellow:
Ferenc Abonyi

Secretary: Andrea Gátiné Laskai

**Institute of Crop Sciences**

**Department of Plant Biotechnology**

Professor: Prof. Dr. Miklós Gábor Fári

Associate professor: Dr. Szilvia Veres

Assistant professor:
Dr. Péter Makleit
Dr. Zsuzsanna Lisztes-Szabó
Dr. Éva Domokosné Szabolcsy

Assistant lecturer:
Szilvia Kovács
Dr. Brigitta Tóth

**Department of Landscape Ecology**

Head of the Institute: Prof. Dr. Péter Pepó

Associate professor: Dr. József Csajbók

Assistant professor:

Dr. Erika Kurasy

Dr. Lajos Fülöp Dóka

Dr. András Szabó

Assistant lecturer:

Dr. Enikő Vári

Adrienn Novák

Secretary:

Endréné Szendrei

Gyöngyi Kovács

Dr. Pál Pepó

Dr. Szilárd Zsolt Tóth

**Institute of Plant Protection**

Head of the Institute: Dr. habil. György Kövics

Associate professor:

Dr. László Radócz

Dr. András Bozsik

Assistant professor:

Dr. Antal Nagy

Senior research fellow:
Dr. Gábor Tarcali
Secretary: Tünde Szabóné Asbolt

**Agricultural Laboratory Centre:**
Associate professor:
Dr. Tünde Pusztahelyi
Dr. Jánosné Borbély
Assistant research fellow:
Nóra Öri

**Institute of Water and Environmental Management**
Head of the Institute: Prof. Dr. Habil János Tamás
Deputy Head of the Institute: Dr. Habil Csaba Juhász

Professor:
Dr. János Tamás
Dr. Lajos Blaskó
Associate professor:
Dr. Csaba Juhász
Dr. Elza Kovács
Assistant professor:
Dr. Attila Nagy
Dr. Csaba Pregun
Assistant lecturer:
Dr. Lili Mézes
Dr. Tünde Fórián
Dr. Ildikó Gombosné Nagy
Assistant research fellow:
Nikolett Szöllősi
Péter Riczu
Technical assistant:
Katalin Bökfő
András Kaszás Tóth
Kamilla Berényi-Katona
Secretary:
Zsuzsanna Szathmáriné Pongor
Lászlóné Huszka Imre
# UNIVERSITY CALENDAR

## Academic year 2015/2016

<table>
<thead>
<tr>
<th>academic year</th>
<th>course/time</th>
<th>examination period</th>
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### BSc

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<td>3rd year</td>
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<td>practise period</td>
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### MSc

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<table>
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<th>2nd semester</th>
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<tr>
<td>1st year</td>
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<tr>
<td>2nd year</td>
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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:

<table>
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<th>Score</th>
<th>Grade</th>
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<tr>
<td>0-59</td>
<td>fail (1)</td>
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<tr>
<td>60-69</td>
<td>pass (2)</td>
</tr>
<tr>
<td>70-79</td>
<td>satisfactory (3)</td>
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<tr>
<td>80-89</td>
<td>good (4)</td>
</tr>
<tr>
<td>90-100</td>
<td>excellent (5)</td>
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</tbody>
</table>

absence for any reason counts as 0%.
If the score of any test is below 60, the student can take a retake test in conformity with the EDUCATION AND EXAMINATION RULES AND REGULATIONS.

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

**Careers:**

Postgraduates may progress to 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)
<table>
<thead>
<tr>
<th>Subject/Coordinator</th>
<th>Semester</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
<th>8.</th>
<th>Numbers of hours</th>
<th>Type of hour (lecture / practice)</th>
<th>Credit</th>
<th>Assessment</th>
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<td>Lecture</td>
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<td>Animal husbandry I.</td>
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<td></td>
<td>1/15L</td>
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<td></td>
<td>2/30L</td>
<td>1/15P</td>
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<td>Economic Sciences II.</td>
<td>4/60L</td>
<td>1/15P</td>
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<td>2/30L</td>
<td>1/15P</td>
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<td>Plant genetics and plant breeding</td>
<td>2/30L</td>
<td>1/15P</td>
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<td>2/30L</td>
<td>1/15P</td>
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<td>1/15P</td>
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<tr>
<td>Statistics</td>
<td>1/15L</td>
<td>1/15P</td>
<td>3 Prac.</td>
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<tr>
<td>Regulation and Administration of Agriculture</td>
<td>2/30L</td>
<td>3 Coll.</td>
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<tr>
<td>Animals Health</td>
<td>1/15L</td>
<td>2 Prac.</td>
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<tr>
<td>Food Technologies</td>
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<td>Quality Management System</td>
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<td>Farm business management</td>
<td>2/30L</td>
<td>2 Coll.</td>
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<tr>
<td>Forest and game management</td>
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<td>Grassland management</td>
<td>1/15L</td>
<td>1/15P</td>
<td>2 Prac.</td>
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<td><strong>Total</strong></td>
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<td><strong>11/165L</strong></td>
<td><strong>12/180L</strong></td>
<td><strong>13/195L</strong></td>
<td><strong>60</strong></td>
<td><strong>13 Coll.</strong></td>
<td><strong>7 Prac.</strong></td>
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</table>

**Disciplinary**

- **Agricultural Practice I.**
  - Crop production
    - 40P
    - 0 S.

- **Agricultural Practice II.**
  - 40P
  - 0 S.

- **Agricultural Practice III.**
  - 40P
  - 0 S.

- **Agricultural Practice IV.**
  - 40P
  - 0 S.

- **Agricultural Practice V.**
  - 40P
  - 0 S.

- **Project work I.**
  - 4/60P
  - 4 Prac.

- **Project work II.**
  - 4/60P
  - 4 Prac.

- **Project work III.**
  - 4/60P
  - 4 Prac.

- **Project work IV.**
  - 4/60P
  - 4 Prac.

- **Plant Patalogy**
  - 1/15L 1/15P
  - 3 Prac.

- **Agricultural entomology**
  - 1/15L 1/15P
  - 3 Prac.

  **Total**
  - 40P
  - 40P
  - 4/60P
  - 1/15L 5/75P
  - 4/60P
  - 22 6 Prac.
  - 5 S.

**Elective**

- **Etology**
  - 1/15L
  - 1 Coll.

- **Forcing and early vegetable production**
  - 2/30L
  - 4 Coll.
<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
<th>Credits</th>
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<tr>
<td>Lake economical husbandry technologies</td>
<td>2/30L</td>
<td>2</td>
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<tr>
<td>Qualification of animal products</td>
<td>2/30L</td>
<td>2</td>
</tr>
<tr>
<td>Soil ecology</td>
<td>2/30L, 1/15P</td>
<td>4</td>
</tr>
<tr>
<td>Irrigated farming</td>
<td>2/30L</td>
<td>2</td>
</tr>
<tr>
<td>Plant nutrition management</td>
<td>2/30L</td>
<td>2</td>
</tr>
<tr>
<td>Medicinal Plants and Spice Crops Production</td>
<td>2/30L</td>
<td>2</td>
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<tr>
<td>Operations management</td>
<td>2/30L</td>
<td>4</td>
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<tr>
<td><strong>Together</strong></td>
<td><strong>2/30L, 1/15P</strong></td>
<td><strong>24</strong></td>
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<tr>
<td>All together</td>
<td><strong>6/90L, 5/75L, 6/90L</strong></td>
<td><strong>9 Coll.</strong></td>
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</tbody>
</table>

Practise period consists two parts:
Students need to participate in practise in the 1. and the 5. semester, they will not get credits for these practise. They have one semester long practise period, it worths 30 credits.
COURSE DESCRIPTIONS

BASIC PRIME COURSES

Zoology

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:

**Agricultural history and EU knowledge**

**Hours per week:** lecture, 2  
**Credit:** 5  
**Assessment:** final exam  
**Course coordinator:** Dr. József Popp, DSc

**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 agroeconomy 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

**Attachments:**

List of definitions

Control questions
**Mathematics**

**Hours per week:** lecture, 2

**Credit:** 5

**Assessment:** grade of practice

**Course coordinator:** Dr. Sándor Kovács, assistant professor

**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.

**Referenced bibliography:**


**Agricultural Chemistry I.**

**Hours per week:** lecture and laboratory practice, 2+2 per week

**Credit:** 5

**Assessment:** terminal examination („colloquium”)

**Course coordinator:** Dr. habil. Imre Vágó, associate professor, CSc

**Course content:** 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).


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.

**Referenced bibliography:**


Agricultural botany

Hours per week: lecture/practical 2+2

Credit: 5

Assessment: written exam

Course coordinator: Dr. Zsuzsa Lisztes Szabó Assistant professor, PhD

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

Referenced bibliography:


Informatics

Hours per week: 0+2

Credit: 3

Assessment: Practical assignment

Course coordinator: Prof. Dr. Miklós Herdon

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.

Referenced bibliography:


Joyce Cox, Curtis Frye, Steve Lambert, Joan Preppernau, Katherine Murray 2007 Microsoft Office System Step by Step

Paul McFedries: Formulas and Functions with Microsoft Office Excel 2007

Free computer Tutorials: http://www.homeandlearn.co.uk/
Animal physiology

Hours per week: lecture+ practice  2+1

Credit: 3

Assessment: oral examination

Course coordinator: Dr. Gabriella Novotni Dankó PhD.

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.
4th: 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..

Referenced bibliography:

Willaim O Reece: Physiology of domestic animals . Lippincott Willims and Wilkins. ISBN:0-683-07240-4
**Organic and Biochemistry**

**Hours per week:** 2 lectures + 1 laboratory practice

**Credit:** 4

**Assessment:** exam

**Course coordinator:** Rita Kremper senior lecturer PhD

**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, polienes (terpenes). Chemical properties of isoprenes compounds.


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.


6th week Aromatic compounds. Structure of bensol, 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

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


Agricultural and Food industrial Microbiology I.

Hours per week: lecture+practice 2 + 1

Credit: 3

Assessment: exam

Course coordinator: Dr. Erzsébet M. Karaffa, associate professor, Ph.D.

Other participant tutors: Dr. Ferenc Peles, assistant professor, Ph.D.

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.


Rural Development

Hours per week: lecture 2

Credit: 3

Assessment: exam

Course coordinator: Dr. habil. Endre Harsányi, PhD

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 regiona and municipality development programs, as well as the methods and techniques of their management, conduction and implementation. As a result of completition of the course, students will be able to apply principles of advanced rural development, as potential managers or professional experts.

Basics of Plant Physiology

Hours per week: lecture+practice 1+1

Credit: 3

Assessment: exam

Prerequisite: Botany

Course coordinator: Dr. Szilvia Veres, assistant professor

Other participant tutors: Dr. Makleit Péter, assistant professor; Dr. Tóth Brigitta, assistant lecturer

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.


Soil Science

Hours per week: lecture+practice 2+1

Credit: 3

Assessment: exam

Course coordinator: Dr. János Kátai, professor

Other participant tutors: Dr. Sándor Zsolt egyetemi tanárségéd, PhD


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

Referenced bibliography:


Water management I.

Hours per week: lecture+practice 2+1

Credit: 4

Assessment: exam

Course coordinator: Dr. Csaba Juhász, egyetemi docens

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.

Referenced bibliography:


**Agricultural fundamentals**

**Hours per week: lecture 2**

**Credit: 3**

**Assessment: exam**

**Course coordinator: Dr. Gabriella Novotná Dankó PhD., associate professor**

**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 meat 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

**Basics of horse breeding and keeping technology**

**Referenced bibliography:**

Environmental Management I-II.

Hours per week: lecturer 2

Credit: 3+2

Assessment: exam

Course coordinator: Dr. Attila Nagy, assistant professor

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.

Land use and regional development

Hours per week: lecture+practice 2+1

Credit: 4

Assessment: exam

Course coordinator: Dr. Nagy János, egyetemi tanár DSc

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.

Referenced bibliography:


Agricultural machinery

Hours per week: lecture+practice 2+2
Credit: 4
Assessment: exam

Course coordinator: Dr. Zoltán Hagymássy, associate professor

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
   Harvesting of rough fodder II
   Machines of truss management and moving
6. Chopping machines
7. Silage production (vertical and horizontal silos).
   Alternative silo solutions
8. Forage mixing facility
10. Mechanisation of milking
11. Automatisation possibilities of milking
    Machines of milk management
12. Machines and equipment of pig keeping
13. Equipment of poultry keeping
14. equipment of sheep keeping

Referenced bibliography:

Szendrő Péter (szerk.): Mezőgazdasági géptan ISBN 9639121177
Szendrő Péter (szerk.): Példák mezőgazdasági géptanból ISBN 9633562066
Árvai András: Az állattartás épületei és gépei ISBN 9639185027
Economic Sciences I.

Hours per week: 4 lecture

Credit: 3

Assessment: exam

Course coordinator: Andrea Bauerné Dr. Gáthy, adj., PhD

Other participant tutors: Mónika Harangi-Rákos, ügyvivő-szakértő

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
15. Rural Development

Referenced bibliography:

Solt Katalin: Makroökonómia /TRI-Mester Kiadó, Tatabánya, 2001/,
Bauerné Gáthy Andrea – Odor Kinga – Popovics Péter (szerk.): Mikroökonómia feladatgyűjtemény – Alapszint /DE AMTC, 2009/,
Bock Gyula: Makroökonómiai feladatok /TRI-Mester Kiadó, Tatabánya, 2001/)
**Crop Production I.**

**Hours per week:** lecture+practice 2+1

**Credit:** 4

**Assessment:** exam

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

**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.

**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.
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.

**Referenced bibliography:**


**Agrochemistry**

**Hours per week: lecture+practice** 2+1

**Credit:** 3

**Assessment:** oral exam

**Course coordinator:** Dr. Andrea Balláné Kovács, PhD

**Other participant tutors:** Rita Kremper senior lecturer PhD

**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 redox potential 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

**Agroeocology**

**Hours per week: lecture+practice 1+1**

**Credit:** 3

**Assessment:** exam

**Course coordinator Dr. Laszlo Lakatos**

**Course content:**

**Thematic plan of course:**

1. Information and it’s 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

Crop requirements, temperature and crop development

**Referenced bibliography:**


PRIME COURSES

Feeding for animals

Hours per week: lecture+practice 2+2

Credit: 5

Assessment: exam

Course coordinator: Dr. Péter Bársony PhD. asisstant professor

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.

Referenced bibliography:


Animal Husbandry I-II.

Hours per week: lecture+practice

Credit: 4+3

Assessment: exam

Course coordinator: Dr. István Komlósi

Other participant tutors: Dr. Levente Czeglédi, assistant professor, PhD -

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.

Referenced bibliography:


Horticulture I.

Hours per week: lecture+practice 1+1

Credit: 2

Assessment: exam

Course coordinator: Dremák Péter, professor assistant

Course content: Universal Fruit Production

Thematic plan of course:

1. Fruit production in Hungary, the European Union and the World
2. Fruit taxonomy, alignment in practice
3. Ecological basis of Hungarian fruit production
4. Orchard establishment
5. Traditional and intensive fruit production systems
6. Correlation of pruning and pest control
7. Correlation of phytotechnical practices and pest control
8. Agrotechnical methods in fruit orchard
9. Irrigation of fruit orchard
10. Fertilization of fruit orchard
11. Pest control
12. Integrated pest control
13. Fruit harvest
14. Post harvest technologies
15. Summary, consultation

Referenced bibliography:

Crop production II.

Hours per week: lecture+practice 2+2

Credit: 4

Assessment: exam

Course coordinator: Dr. Csajbók József assistant professor, PhD

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.

Referenced bibliography:


Economic Sciences II.

Hours per week: lecture+practice 2+1

Credit: 3

Assessment: Students write 2 exams, which results together with the results of the other part of the subject (Accounting) will make the final result of the subject.

Course coordinator: Dr. László Posta, senior lecturer, CSc.

Other participant tutors: Dr. Hajnalka Madai, junior lecturer, PhD; Dr. Ferenc Búzás research fellow, PhD.

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
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

Referenced bibliography:

(All the above mentioned are in Hungarian language.)
**Water management II.**

**Hours per week:** lecture+practice 2+1

**Credit:** 3

**Assessment:** exam

**Prerequisite:** Water management I.

**Course coordinator:** Dr. Csaba Juhász, associate professor:

**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.

**Referenced bibliography:**


**Plant genetics and plant breeding**

**Hours per week:** lecture+practice 2+1

**Credit:** 3

**Assessment:** exam

**Course coordinator:** Prof. Pal Pepo

**Course content:** This course focuses both on the fundamentals of genetics/biotechnology and sophisticated methods applied in it. Scientific background will be provided to the biotechnology of sexual/asexual reproduction. This course will explore the methods of the tissue culture. Student will learn the mechanisms of genetic transformation. We will examine those questions strongly related to plant resistance. Student will learn the regulation of GMO’s and examine plant genomics emphasized nowadays. Student knowledge will be highly enlarged in applied genetics/biotechnology with the attendance of this course.

**Referenced bibliography:**


Horticulture II.

Hours per week: lecture+practice 2+1

Credit: 2

Assessment: terminal examination (oral)

Course coordinator: Takácsné dr. habil Hájos Mária CSc, associate professor

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.

The environmental claim of cabbage, the peculiarities of its growing

Referenced bibliography:

Economic Sciences III.

Hours per week: lecture+practice 4+0

Credit: 4

Assessment: written terminal examination

Course coordinator: Dr. habil. Pető Károly CSc. Associate professor

Other participant tutors: Dr. habil. Pakurár Miklós PhD.. Associate professor Dr. Varga Levente PhD, assistant ....

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

Referenced bibliography:


Bauer A. –Berács J.: Bevezetés a marketingbe (Bp., 2006)

Hajós-Pakurár-Berde: Szervezés és logisztika notes (2007, HEFOP)

Szegedi - Prezenszki (2003): Logisztika-menedzsment, Kossuth Könyvkiadó, Budapest


Statistics

Hours per week: lecture+practice 1+1

Credit: 3

Assessment: practice

Course coordinator: Dr. Péter Balogh, PhD, associate professor

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.
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. Multifactoral (two and three factors) models
12. Post hoc multiple comparisons for observed means.

Referenced bibliography:

Regulation and Administration of Agriculture

Hours per week: lecture 1
Credit: 3
Assessment: exam
Course coordinator: Dr. Imre Andorkó, legal consultant
Course content:

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 hungarian 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.

Fundamentals of Labour Law

Referenced bibliography:
Animal health

Hours per week: lecture+practice 1+1

Credit: 2

Assessment: exam

Course coordinator: Dr. Nóra Vass

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.
4. Institution regime in animal health.
5. Environment hygiene in animal breeding (projection of a farm, protection).
6. Fodder- hygiene
7. OIE listed diseases
8-10. Viral diseases.
11. Diseases caused by prions.
15. 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.

Parturition.
Referenced bibliography:


Quality management systems

Hours per week: lecture+practice 2+0
Credit: 2
Assessment: exam

Course coordinator: Dr. Ferenc Peles, assistant professor, Ph.D.

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.

Referenced bibliography:

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 concept, ILSI Europe, 2004
Farm business management

Hours per week: lecture+practice 2+0

Credit: 2

Assessment: exam

Course coordinator: János Felföldi, associate professor, Ph.D.

Other participant tutors: László Szöllösi, assistant professor, Ph.D.

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

Referenced bibliography:


Forest and game management 1.

Hours per week: lecture+practice 2+1

Credit: 5

Assessment: exam

Course coordinator: Károly Rédei DSc, professor

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.

Referenced bibliography:


MÁTYÁS,CS. (1983): An Introduction to Forest Tree Improvement, Sopron, University Press.


**Grassland management**

**Hours per week:** lecture+practice 1+1

**Credit:** 2

**Assessment:** exam

**Course coordinator:** Prof. Dr. Géza Nagy Géza, PhD.

**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.

**Referenced bibliography:**

**Integrated Plant Protection**

**Hours per week: lecture+practice 1+1**

**Credit: 3**

**Assessment: exam**

**Course coordinator: Dr. habil. Radócz László CSc, associate professor**

**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.
7. Weed management in vegetables and fruits.
8. Basic of integrated plant protection and plant protective forecasting.
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.
15. Integrated plant protection of grapes.

**Referenced bibliography:**


Diseases of Fruits and Vegetables - Diagnosis and Management
Edited by S Naqvi Springer 2004

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

Agricultural practise I-V.

Hours per week: practice: 40
Credit: 0

Assessment: exam

Course coordinator: Dr. János Posta, lecturer, Ph.D.

Other participant tutors: Dr. Lajos Fülöp Dóka, lecturer, PhD

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.
Project work I.

Hours per week: practice 3  
Credit: 4  
Assessment: practice

Course coordinator: Dr. János Kátai, CSc

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.

Referenced bibliography:

Kátai, J. Lecture notes.
**Project work II.**

**Hours per week: practice 3**

**Credit:** 4

**Assessment:** exam

**Course coordinator:** Dr. János Kátai, CSc

**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 methodologies
3. Perform necessary laboratories examinations
4. Literary processing

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

**Referenced bibliography:**

Kátai, J. Lecture notes.
Project work III.

Hours per week: practice 3

Credit: 4

Assessment: practice

Course coordinator: Dr. János Kátai, CSc

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

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

Referenced bibliography: Kátai, J. Lecture notes.
Project work IV.

Hours per week: practice 3

Credit: 4

Assessment: practice

Course coordinator: Dr. János Kátai, CSc

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

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.

Referenced bibliography: Kátai, J. Lecture notes.
Agricultural entomology

Hours per week: 1 hour lectures, 1 hour practical classes

Credit: 3

Assessment: Practical assignment

Prerequisite: The finishing of Agricultural Zoology, Agricultural Botany, Plant Physiology, General and Agricultural Chemistry are conditions of a take up of the subject

Course coordinator: András Bozsik PhD, associate professor

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.


3. Individual ecology, population dynamics. General knowledge of the pest control (physical, chemical, biological, biotechnological, integrated).


6. Pests of leguminous crops, sunflower, the stored products, cabbage and rape. 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.

ELECTIVE

Ethology

Hours per week: lecture: 1
Credit: 1
Assessment: exam

Course coordinator: Gabriella Novotni Dankó PhD, associate professor

Course content: The ethology subject introduces and gives fundamental knowledge about behavior of farm animals. Animals’ health and welfare is very important in modern animal husbandry and farming system. Keeping technologies adapted to the instinctive habits of the animal and human-animal interaction effects the efficiency of production.

Thematic plan of lectures:
1. Basic concepts of ethology, the role of ethology in control of production of farm animals.
2. Physiology, motivation and organization of behavior
3. Keeping technology and the social behavior of cattle
4. Keeping technology and the social behavior of pig
5. Keeping technology and the social behavior of sheep
6. Keeping technology and the social behavior of horse
7. Keeping technology and the social behavior of poultry
8. Reproduction and parental behavior of pig
9. Reproduction and parental behavior of cattle and sheep
10. Reproduction and parental behavior of horse
11. Reproduction and parental behavior of poultry
13. Learning and cognition
14. Behavioral disturbance, stress and welfare

Referenced bibliography:

Forcing and early vegetable production

Hours per week: lecture+practice 2+1

Credit: 4

Assessment: terminal examination (oral)

Course coordinator:

Course content: The students get knowledge about the vegetable with the more important devices of forcing, the opportunity of the climate regulation, and with the growing of the more important races. The students receive informations furthermore from the professional nursing and the modern growing manners.

Thematic plan of lectures:

1. The concept of vegetable forcing, importance, equipments
2. Technologies promoting earliness
3. Climate regulation – temperature, light, humidity, CO₂ level
4. The practice of watering in the forcing, the quality of waters
5. The importance of soil and plant covering and their devices – the colour of blanket substances, plastic tunnels
6. Heating methods, shading technique
7. Seed treatment procedures before sowing; the methods of seedling production and devices
8. Nutrition supply, soil and nutrition demand, manuring
9. The forcing of sweet pepper
10. The forcing of sweet tomato
11. The forcing of cucumber and melons
12. The forcing of cabbages and Chinese Savoy cabbage.
14. The forcing of onion and lettuce.
The role of special vegetables in the forcing

Referenced bibliography:
Lake economical husbandry technologies

Hours per week: lecture 2

Credit: 2

Assessment: exam

Course coordinator: Dr. Péter Bársony PhD. assistant professor

Course content: In this semester the students will learn about the background of the fishponds. Get knowledge about the fish species, the technology, and the economy.

Referenced bibliography:


Qualification of animal products

Hours per week: lecture+practice 2+2

Credit: 2

Assessment: exam

Course coordinator: Dr. Zsófia Várszegi

Course content: The student will during the course have gained a solid theoretical understanding of quality and the components responsible for quality of animal products. The student will also gain insight into different analytical methods and possibilities for influencing/improving important quality parameters. The student is presented to the basic principles of quality, definitions and the needs for appropriate analytical methods and ways of influencing quality. The students are further expected to gain detailed knowledge related to central sensory, nutritionally and processing related quality parameters, as well as the importance of ethical and hygienically safe products. Insight into the factors regulating quality in practical production will be gained through the excursion and visit to applied research institutions.

Referenced bibliography:


Soil Ecology

Hours per week: lecture+practice 2+1
Credit: 4
Assessment: exam

Course coordinator: Dr. János Kátai, professor CSc

Other participant tutors: Dr. Zsolt Sándor, assistant professor, PhD.


During practices the microbial features of various soils and the the representatives of the main groups of living organisms will be known by the students.

Referenced bibliography:
A kötelező, illetve ajánlott irodalom:
Irrigated farming

Hours per week: lecture+practice 2+1

Credit: 2

Assessment: exam

Course coordinator: Dr. József Csajbók, associate professor, Ph.D.


Thematic plan of lectures:

1st week Interaction between water management and crop production in agriculture.
2nd week Water balance of plants, water demand of plants.
3rd week Bases of water regulation in crop production.
4th week Learning of significance of environment friendly and economic irrigation.
5th week Effect of irrigation on soil and plants.
6th week Production requirements of irrigation.
7th week Aims of irrigated crop production.
8th week Necessary of irrigation, efficiency of water use.
9th week Principles of fertilization in irrigated fields.
10th week Evaluation of irrigation patterns.
11th week Main functions of irrigation and crop production.
12th week Correlations between irrigation and yield stability.
13th week Irrigation regime of main crops I. (green pea, alfalfa, red clover)
14th week Irrigation regime of main crops II. (corn, sweet corn, corn seed)
15th week Irrigation regime of main crops III. (rice, potato, sugar beet

**Referenced bibliography:**


Plant nutrition management

Hours per week: lecture+practice 1+1

Credit: 2

Assessment: exam

Course coordinator: Dr Pepó Péter, Professor DSc

Other participant tutors: Dr. Mihály Sárvári, Professor CSc


Crop production in Hungary and worldwide, development trends. The aim, function and history of fertilization. The role of macro- (NPK), meso – (Cs, Mg) and microelements in plants. Evaluation of the factors influencing the nutrient uptake of crops. Beneficial and unfavourable impacts of NPK fertilizers. NPK fertilization in the past and nowaday. Methods for determining the available NPK content of soils and their most important characteristics. Major principles of planning NPK fertilization. Major principles of making farm fertilization plans. Forms of organic manure application, practice of fertilization with manure. Forms of green manure and their application in the practice. The role of crop residues and root remains in the nutrient supply of plants. Mineralization of organic matters. Definition of the nutrient balance, its major characteristics and history in Hungary. Definition and practice of precision fertilization. Study the technology of the Agrochemical Centre at Nádudvar. Relationship between biological basic and nutrient management. Effect of abiotic on plant nutrient uptake and production.

Requirements: Within the frame of the course, the students will acquire knowledge on environmentally-begining, efficient plant nutrition. The theoretical and practical relationships of fertilization in crop production. The impact of NPK fertilization on yield quality and quantity and soil fertility. Optimisation, rationalisation and innovation in fertilization. Effective extension as a result of the acquired knowledge.

Referenced bibliography:

Medicinal plants and spice crops production

Hours per week: lecture+practice 2+1

Credit: 2

Assessment: exam

Course coordinator: Dr. Erika Kutasy assistant professor, PhD

Course content: Giving thematic and complex informations about the ecological conditions, production technology, storing and processing medicinal plants and spice crops. Studying general and specific questions of production of herbs. Knowing and applying the production technology and quality requirements.

Thematic plan of lectures:
1. Medicinal plant production in Hungary and in the world.
2. Agroecological conditions of production of medicinal and spice crops.
3. Drugs and their systematization.
4. Genetic background of medicinal and spice crops farming.
5. Gathering of medicinal plants.
6. General and specific questions of production technology of medicinal and spice crops I.
7. General and specific questions of production technology of medicinal and spice crops II.
9. Processing and storing of medicinal and spice crops, extraction of active agents.
10. Qualifying of herbs.
11. Production of annual herbs I.
12. Production of annual herbs II.
13. Production of biennial herbs
14. Production of perennial herbs I.
15. Production of perennial herbs I.

Referenced bibliography:
Karin Kraft/Christopher Hobbs: Pocket Guide to Herbal Medicine, 2004
Rudolph Fritz Weiss/Volker Fintelmann: Herbal Medicine, 2000
Recommended literature:
Herbal Medicine Expanded Commission E Monographs, American Botanical Council, 2000
Frauke Gaedcke, Barbara Steinhoff: Herbal Medicinal Products. Scientific and Regulatory Basis for
DE AGTC
**Operations Management**

**Hours per week: lecture+practice 2+1**

**Credit:** 4

**Assessment:** exam

**Course coordinator:** Dr. Miklós Pakurár, associate professor, PhD

**Other participant tutors:** Dr. László Terjék assistant professor, PhD

**Course content:** Operations and supply chain management introduction, Quality and quality management, Process capability and statistical process control, Designing products, Designing services, Process design and technology, Capacity and facility planning, HR in operations management, Strategic supply chain management and design, Supply chain procurement and distribution globalization, Forecasting, Role of inventory management, Aggregate sales and operations planning, Resource planning systems, Lean system methods, Scheduling

Competencies: Completing the subject student will understand the main tasks of operations management and supply chain management. Students will be able to solve problems in operations management and supply chain management. Students will be capable to plan, control, and develop production and service enterprises focusing mainly on the agricultural production and food industry.

**Referenced bibliography:**


