Subject program „1TR17/BOT1 Botany I”

Year: 2019/2020 Status: Active

Subject language	Estonian
Creditpoints	4 ECTS
Grading method	Distinctive (letters)
Academicians	

General

Subject objective	To acquire the basic knowledge of the structure of plants and their functions in order to pass specialty subjects related to medicinal plants (pharmacognosy, phytotherapy) and to understand the importance of plants in nature and human life.
Learning outcomes	1. Has knowledge of the structure of plant cells, plant tissues and plant organs and their function in plants. 2. Is able to explain the specific nature of plant breeding and their life cycle. 3. Has knowledge of the principles of plant classification. 4. Knows the richest in the species plant families and the most important plant species, cultivated plants and medicinal plants belonging to them. 5. Has knowledge of the most important physiological processes in plants (photosynthesis, transpiration, mineral nutrition).

Learning outcomes	
1.Outcome	Student has knowledge of the structure of plant cells, plant tissues and plant organs and their function in plants.
grade „Sufficient(E)”	Student's knowledge on the structure, functions and tasks of the plant cell are sufficient, there is no comprehensive understanding of the processes taking place in the plant cell and which processes certain organelles are responsible for. Student knows different types of plant tissues and organs and their location in the plant but knowledge on their functions and structure is lacking.
grade „Satisfactory(D)”	Student's knowledge on the structure, functions and tasks of the plant cell are somewhat lacking, there is no comprehensive understanding of the processes taking place in the plant cell and which processes certain organelles are responsible for. Student knows different types of plant tissues and organs, their location in the plant but knowledge on their functions and structure are lacking.

Learning outcomes	
grade „Good(C)”	Student's knowledge on the structure, functions and tasks of the plant cell are somewhat lacking, there is no comprehensive understanding of the processes taking place in the plant cell and which processes certain organelles are responsible for. Student knows different types of plant tissues and organs, their location in the plant, but there is an insufficient understanding of the underlying connections of the processes.
grade „Very good(B)”	Student knows the most important structural differences of a plant cell compared to other cells, knows most of the organelles in the plant cell and their tasks in ensuring the functioning of the cell. Student has basic knowledge on the processes taking place inside the cell, the multiplying systems of the cells and the main concepts of genetics. Student knows the different types of plant tissues and organs, understands the differences of their functions and location in the plant.
grade „Excellent(A)”	Student knows the structural characteristics of the plant cell compared to other cells, knows the organelles in the plant cell and their role in ensuring the functioning of the cell. Student knows the processes taking place in the cell, the multiplying cycles of the cells and the main concepts of genetics. Student knows the main types of plant tissues and organs, the differences in their structure and functions and the location and tasks in the plants.
2.Outcome	Is able to explain the characteristics of the reproduction and life cycle of plants.
grade „Sufficient(E)”	Student knows different processes connected to the plant reproduction but an understanding of the more specific nature of the processes is lacking, knowledge is incomplete and there are gaps.
grade „Satisfactory(D)”	Student knows the key processes connected to the plant reproduction: sexual reproduction, vegetative reproduction, pollination, formation of fruits and seeds, structure and distribution of plants. Faults and mistakes occur in the knowledge, a comprehensive understanding of the processes is lacking.
grade „Good(C)”	Student knows the key processes connected to the plant reproduction: sexual reproduction, vegetative reproduction, pollination, formation of fruits and seeds, structure and distribution of plants. Some mistakes in the knowledge occur.
grade „Very good(B)”	Student knows the key processes connected to the plant reproduction: sexual reproduction, vegetative reproduction, pollination, formation of fruits and seeds, structure and distribution of plants. Only a few mistakes occur.
grade „Excellent(A)”	Student knows the key processes connected to the plant reproduction: sexual reproduction, vegetative reproduction, pollination, formation of fruits and seeds, structure and distribution of plants. The knowledge is comprehensive and no mistakes occur.

Learning outcomes	
3.Outcome	Has an overview of the main physiological processes inside plants (photosynthesis, transpiration, mineral nutrition).
grade „Sufficient(E)”	Students knowledge is incomplete, confusion occurs in understanding the terms, there is no comprehensive understanding of the physiological processes and substance circling inside the plants as well as the interconnectedness of the processes.
grade „Satisfactory(D)”	Student understands the general nature of the main physiological processes but some confusion occurs in comprehending the interconnectedness of the processes and in understanding the terms.
grade „Good(C)”	Student knows the main physiological processes inside plants: photosynthesis, respiration, mineral nutrition, growth and development; understands the nutrient cycling between the plant and the environment, the substance moving and transforming inside the plant and plant stress. Some gaps in the knowledge occur.
grade „Very good(B)”	Student knows the main physiological processes of the plants: photosynthesis, respiration, mineral nutrition, growth and development; understands the nutrient cycling between the plant and the environment, the substance moving and transforming inside the plant and plant stress. A few gaps in the knowledge occur.
grade „Excellent(A)”	Student knows the main physiological processes of the plants: photosynthesis, respiration, mineral nutrition, growth and development; understands the nutrient cycling between the plant and the environment, the substance moving and transforming inside the plant and plant stress. The knowledge is correct.
4.Outcome	Knows the richest in the species plant families and the most important plant species, cultivated plants and medicinal plants belonging to them.
grade „Sufficient(E)”	Student knows the most common plant families and some important plant species, cultivated plants and medicinal plants belonging to them, but has gaps in knowledge.
grade „Satisfactory(D)”	Student knows the most common plant families and some important plant species, cultivated plants and medicinal plants belonging to them, but the knowledge is lacking.
grade „Good(C)”	Student knows the most common plant families and some important plant species, cultivated plants and medicinal plants belonging to them, but has some gaps in knowledge.
grade „Very good(B)”	Student knows the most species-rich plant families and some important plant species, cultivated plants and medicinal plants belonging to them, minor gaps in knowledge occur.
grade „Excellent(A)”	Student knows the most species-rich plant families and the most important plant species, cultivated plants and medicinal plants belonging to them.
5.Outcome	Has an overview of the classification principles of the plants.

Learning outcomes	
grade „Sufficient(E)”	Student understands the main principles of biosystematics, confusion occurs in understanding the plant taxonomy. Major deficits in knowledge occur in recognizing the most widespread Estonian plants and in distinguishing between them.
grade „Satisfactory(D)”	Student understands the main principles of biosystematics, confusion occurs in understanding the plant taxonomy. Some knowledge gaps occur in recognizing Estonian plants and in distinguishing between them.
grade „Good(C)”	Student understands the main principles of biosystematics, knows the plant taxonomy and the classification of species. Student knows the most widespread Estonian plants and medicinal herbs and is able to distinguish between them. Occasional gaps in the knowledge occur.
grade „Very good(B)”	Student understands the main principles of biosystematics, knows the plant taxonomy and the classification of species. Student knows the most widespread Estonian plants and medicinal herbs and is able to distinguish between them. A few gaps in the knowledge occur.
grade „Excellent(A)”	Student understands the main principles of biosystematics, knows the plant taxonomy and the classification of species. Student knows the most widespread Estonian plants and medicinal herbs and is able to distinguish between them. The knowledge is comprehensive and correct.

Subject program parts

default

Changer confirm	Kaie Eha 26.08.2019
Reviewer confirm	Merle Kiloman 26.08.2019
Administrator confirm	Kristiina Puura 26.08.2019

Study in different study forms

Study form	Lecture	Excerice	Seminar	Practice	Homework	Internet study	Out of office	Practical training
All study forms	46.0			32.0	26.0			

General description

Botany is the scientific study of plants. During the subject course the plants structure and functions are investigated on a micro and macro level, the systematics of the plant world, physical and chemical properties of different plant families are studied.

Forms of studying

The subject consists of sets of lectures and practical classes, where according to the topics the lecture is followed by a practical class in order to reinforce the material. Within the subject study visits are held to the Tallinn Botanic Garden and forest biocoenosis. Participation in practical classes and study visits is mandatory.

Teaching methods
Lectures, practical classes, independent work.

Content and method for independent study
Reading obligatory and additional literature, going through the study materials, passing tests in Moodle environment, preparing for tests and the exam. Defending protocols during the last practical class.
The timetable and learning instructions to the subject are uploaded to the Moodle environment.

Required reading (K)
Leht, M. (toim). (2010). Eesti taimede määraja. Tartu: Eesti Loodusfoto.
Kukk, T. (1996). Soontaimede anatoomia väike praktikum. Tartu: Tartu Ülikooli kirjastus.
Additional materials in Moodle environment.

Recommended reading (T)
Mauseth, J.D. (2014). Botany: An Introduction to Plant Biology. Fifth edition. Jones & Bartlett Learning
Taiz, L., Zeiger, E., et. (2015). Plant Physiology and Development. Sixth edition. Sinauer Associates, Inc.
Värva, M. (2004). Meie ravimtaimed. Tartu: Elmatar
Kukk, T. (2004). Eesti taimede kukeaabits. Tallinn: Varrak
Hržanovski, V. (1988). Botaanika: õpik tehnikumidele. Tallinn: Valgus.

Methods of assessment
The subject ends with an exam. The prerequisites for taking the exam are: all tests must be passed timely with a positive grade with a threshold of 51%; participation in all practical classes. Final grade is formed from the test's grades which threshold is 51% (altogether 40%) and the exam results (60%).
Exam consists of modules based on learning outcomes and each module must be passed with a positive result.

Additional information
The subject has a Moodle e-support which contains additional learning materials and obligatory self-control tests.
All questions are answered by the lecturer: kaie.eha@ttk.ee

Subject program

Nr	Activity	Hours	Literature	Academicians
1.	Sissejuhatus ainesse; Taimerakk ja selle organellid, toimimine ja ülesanded. / Introduction to the subject; Plant cell and its organelles, its functioning and tasks.	6	Kukk, T. Soontaimede anatoomia väike praktikum. Tartu, Tartu Ülikooli kirjastus, 1996	Kaie Eha

2.	Taimede koed, nende funktsioneerimine ja ülesanded. / Plant cells, their functioning and tasks.	6	Kukk, T. Soontaimede anatoomia väike praktikum. Tartu, Tartu Ülikooli kirjastus, 1996	Kaie Eha
3.	Taimede elundid: Vegetatiivsed elundid, taimefüsioloogia. / Plant organs: vegetative organs, plant physiology.	8	Kukk, T. Soontaimede anatoomia väike praktikum. Tartu, Tartu Ülikooli kirjastus, 1996 Krall, H., Kukk, T., jt. Eesti taimede määraja.	Kaie Eha
4.	Taimede elundid: Generatiivsed elundid, taimede paljunemine. / Plant organs: generative organs and plant reproduction.	8	Kukk, T. Soontaimede anatoomia väike praktikum. Tartu, Tartu Ülikooli kirjastus, 1996	Kaie Eha
5.	Taimeriigi süstemaatika. / Systematics of the plant world.	4	Krall, H., Kukk, T., jt. Eesti taimede määraja. Õppematerjalid ja elektroonilised andmebaasid Moodle e-õppes.	Kaie Eha
6.	Alamad taimed. / Lower plants.	4	Mauseth, J.D., Botany: An Introduction to Plant Biology. Fifth edition. Jones & Bartlett Learning, 2014	Kaie Eha
7.	Kõrgemad taimed: eostaimed, paljasseemnetaimed, katteseemnetaimed. / Higher plants: spore-bearing plants, gymnospermae and angiospermae plants.	6	Mauseth, J.D., Botany: An Introduction to Plant Biology. Fifth edition. Jones & Bartlett Learning, 2014 Krall, H., Kukk, T., jt. Eesti taimede määraja.	Kaie Eha
8.	Levinumad taimed Eestis, Eesti ravimtaimed. / Most widespread plants in Estonia. Estonian medicinal plants.	4	Värva, M., Meie ravimtaimed. Elmatar, Tartu 2004 Kukk, T., Eesti taimede kukeaabits. Varrak, Tallinn 2004	Kaie Eha

9.	Praktikumid: Rakk; Koed; Vegetatiivsed elundid; Generatiivsed elundid; Süstemaatika. / Practical classes: Cell; Tissues; Vegetative organs; Generative organs; Systematics. Õppekäik Botaanikaaeda; õppekäik metsakooslusesse. / Study visit to Botanic Garden; Study visit to forest biocoenosis.	32	Praktikumi juhend. /Instructions to practical classes. Krall, H., Kukk, T., jt. Eesti taimede määraja. Kukk, T. Soontaimede anatoomia väike praktikum. Tartu, Tartu Ülikooli kirjastus, 1996 Kukk, T., Eesti taimede kukeaabits. Varrak, Tallinn 2004	Kaie Eha