TEACHING DISCIPLINE: Ecophysiology, I th Year of study, II th Semester)

Credit value (ECTS): 3

Course category: mandatory

Course holder: Lecturer dr. Alina Elena MARTA

Discipline objectives (course and practical works)

The course aims to provide students with knowledge on the latest basic and practical information from the interference of both biology and agricultural science fields, with the purpose of deepening the vital processes occurring inside the plants cultivated either under optimal or unfavorable life conditions.

Specific aims :

- the study of fundamental biological processes in plants: the absorption of minerals and energy and their transformation into other own organic substances, the breathing , the biosynthesis of organic substances
- the study of the growth and development processes of plants, but also the water use, fertilization, various hormone treatments etc, in order to stimulate these processes and mechanisms of resistance of plants to abiotic and biotic environmental conditions;
- the knowledge of the relationships between plant physiology and other biological and technical disciplines in the study of physiological processes and in developing the practical purpose of physiology .

Contents (syllabus)

Course (chapters/subchapters)
Introduction to Plant ecophysiological: definition and objectives; research methods.
The ecophysiological role of water: water as environmental factor; physiological functions of water in plant life; influence of environmental factors on the absorption, transport and disposal of water
Plants and carbon balance in the environment: carbon assimilation by plants: photosynthesis; sources of carbon for plants; role of environmental factors in carbon assimilation; fotorespiration
Plant growth under the influence of environmental factors: the stages of cell growth; particularities growth in different organs; influence of environmental factors on growth; bioactive growth
Development of plants under the influence of environmental factors: the flowering and fruition; vernalization; photoperiodicity
Plant resistance to the action of negative environmental abiotic factors: pests pathogens; physiological response of plants to pathogens attack
Plant resistance to the action of negative environmental abiotic factors: positive low temperatures pests; pests negative low temperatures; pests high temperatures and dehydration; pests of high salt concentration; pests air and soil pollution; general mechanisms of plant resistance to stress

Practical works
Presentation of Plant Physiology laboratory: safety rules; laboratory equipment and utensils; fair working practices, organization of the seminar (informing students on discipline objectives, the targeted skills, the criteria and evaluation methods). **Absorption, circulation and elimination of water from plants**
Determination of photosynthetic activity of plants under stress: analysis of chlorophyll content, stomatal conductance analysis
Ecophysiological reaction of plants to drought: analysis pace of dried leaves, determining the osmotic pressure of cellular juice
Plant eco-physiological reaction to stress saline: determination of proline, total chlorophyll content analysis
Pests negative low temperatures, frost resistance of plants
Final colloquium of knowledge evaluation

Bibliography

1. Jitareanu Carmen Doina, Alina Elena Marta, 2018 – Fiziologie vegetala: manual de studiu pentru studenti, Edit. "Ion Ionescu de la Brad", Iaşi.
2. Jităreanu Carmenica Doina (2007) – *Fiziologia plantelor*. Edit. "Ion Ionescu de la Brad", Iaşi.
3. Jităreanu Carmenica Doina (2002) - *Fiziologie vegetală*. Edit. "Ion Ionescu de la Brad", Iaşi.
4. Toma Liana Doina, Jităreanu Carmenica Doina (2007) – *Fiziologie vegetală*. Edit. "Ion Ionescu de la Brad", Iaşi.
5. Jităreanu Carmen Doina, Marta Alina Elena, 2020 – Lucrări practice de fiziologia plantelor, vol I, Edit. Ion Ionescu de la Brad, Iaşi
6. Jităreanu Carmen Doina, Doina Liana Toma, Cristina Slabu, Alina Elena Marta, 2011 - Lucrări practice de fiziologia plantelor, ISBN 978-973-147-076-4.
7. Jităreanu Carmen Doina, Alina Elena Marta, Cristina Slabu, 2014 - *Bazele experimentale ale fiziologiei plantelor*, ISBN 978-973-0-17661-2.

Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Course	Exam	70%
	presence	
Practical works	Tests + cours and practical	30%

Contact

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