

Applied ecophysiology (1st Year, 2nd Semester)

Credit value (ECTS) 4

Course category

optional discipline

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 ecophysiology and other biological and technical disciplines in the study of physiological processes and in developing the practical purpose of ecophysiology .

Content (syllabus)

| Course (chapters / subchapters) |
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| 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

| Practicum |
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| 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", Iași.
- 2. Jitareanu Carmenica Doina, 2007 – Fiziologia plantelor.** Edit. "Ion Ionescu de la Brad", Iași.
- 3. Jitareanu Carmenica Doina, Toma Liana-Doina, Slabu Cristina, Marta Alina Elena, 2011- Lucrări practice de Fiziologia plantelor -** Edit. Ion Ionescu de la Brad, Iași, ISBN - 978-973-147-076-4
- 4. Jitareanu Carmenica Doina, Slabu Cristina, Marta Alina Elena – Bazele practice ale fiziologiei vegetale.**

Evaluation

| Type of evaluation | Methods of evaluation | Percentage of the final grade |
|--|-----------------------------------|--------------------------------------|
| Examination | Written examination | 70% |
| Assessment of the activity during the semester | Verification tests, oral practice | 30% |

Contact person

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