

## **Plant Physiology (2<sup>nd</sup> Year, 3<sup>rd</sup> Semester)**

**No of transferable credits 4**

### **Regime of the discipline**

Fundamental discipline (compulsory)

### **Titular of the discipline**

**Professor PhD Doina Carmenica JITAREANU**

### **The objectives of the discipline (course and practice)**

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. It is insisted on the possibilities that the specialist have to change or direct the processes of growth and development, of photosynthesis and nutrition that lead to crop formation, according to interest of production.

During practical works students are intended to acquire practical skills for the experimental demonstration of the main vital manifestations of the vegetal organism and to develop skills in plant physiology.

### **Content (syllabus)**

| <b>Course (chapters / subchapters)</b>                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Introduction to plant physiology:</b> definition and objectives; research methods; connections with other sciences; plant physiology in Romania.                                                                                           |
| <b>Plant cell physiology:</b> physiological functions of cellular components; physical properties of the cellular material; physiological properties of living matter; exchange of water between the plant cell and the external environment. |
| <b>Water regime of plants:</b> role of water in plants' life; water states and forms in plants; water absorption by plants; water transport inside the plants; water elimination on plants.                                                   |
| <b>Plant mineral nutrition:</b> research methods for mineral nutrition; mineral absorption by plants; factors influencing the absorption of mineral elements in plants; the physiological role of mineral elements.                           |

**Photosynthesis:** definition and importance in nature; carbon and light sources; the method of studying photosynthesis; organs and organelles of photosynthesis; photosynthesis mechanism; factors influencing photosynthesis; photosynthesis and production.

### Practical works

**Presentation of Plant Physiology Laboratory;** Work safety rules; Laboratory equipment and tools; Proper working practices in physiology lab.

**Physical and physiological phenomena at the cellular level:** Absorption and elution; Imbibition; Diffusion; Osmosis; Turgescence and plasmolysis; Cellular osmotic potential; Cellar suction force, Membranes permeability.

**Water regime of plants:** Water absorption in plants; Water circulation in plants; Water elimination on plants.

**Mineral nutrition of plants:** Methods of studying plants mineral nutrition; Particularities of root absorption of mineral elements.

**Photosynthesis:** Photosynthetic pigments; Methods of studying photosynthesis; The products of photosynthesis.

**Final colloquium for knowledge evaluation**

### Bibliography

1. **Jitäreanu Carmenica Doina**, 2002, *Plant Physiology*. Edit. "Ion Ionescu de la Brad", Iasi, ISBN: 973-8014-88-3.
2. **Jitäreanu Carmenica Doina**, 2007, *Plant Physiology*. Edit. "Ion Ionescu de la Brad", Iasi, ISBN: 978-973-7921-89-5.
3. **Jitäreanu, Carmenica Doina**, Toma, Liana Doina, Slabu, Cristina, Marta, Alina Elena, 2011, *Practical work on plants' physiology*. Edit. "Ion Ionescu de la Brad", Iasi, ISBN: 978-973-147-076-4.
4. **Jitäreanu, Carmenica Doina**, Marta, Alina Elena, Slabu, Cristina, 2014, *Experimental basis of plant physiology*, Braila, ISBN 978-973-0-17661-2
5. **Jitäreanu Carmenica Doina**, Alina Elena Marta, 2018, *Plant Physiology* (Study manual for students), Edit. Ion Ionescu de la Brad, Iasi, ISBN 978-973-147-302-4.
6. **Jitäreanu Carmen Doina**, Alina Elena Marta, 2020, *Practical works on plant physiology* (vol. I), Edit. Ion Ionescu de la Brad, Iasi, ISBN: 978-973-147-356-7

**7. Jitäreanu Carmenica Doina** (coordinator chapter 4), 2021, *Practice manual - Horticulture Specialization*, vol. I, Edit. "Ion Ionescu de la Brad", Iași, ISBN 978-973-147-406-9; ISBN 978-973-147-407-6.

**8.** Toma Liana Doina, Robu T., 2000, *Plant Physiology (Second edition, revised and completed)*, Edit. "Ion Ionescu de la Brad", Iași, ISBN: 973-8014-17-4.

**9.** Toma, Liana Doina, **Jitäreanu, Carmenica Doina**, 2007, *Plant Physiology*, Edit. "Ion Ionescu de la Brad", Iași, ISBN: 973-8014-24-7.

**10.** Toma, Liana Doina, **Jitäreanu, Carmenica Doina**, 2000, *Plant Physiology*, Edit. "Ion Ionescu de la Brad", Iași, ISBN: 978-973-147-001-6.

### **Final evaluation**

| <b>Type of evaluation</b>                      | <b>Methods of evaluation</b>      | <b>Percentage of the final grade</b> |
|------------------------------------------------|-----------------------------------|--------------------------------------|
| Examination                                    | Written examination               | 60%                                  |
| Assessment of the activity during the semester | Verification tests, oral practice | 40%                                  |

### **Contact person**

**Professor Doctor JIȚĂREANU Carmenica Doina**

Faculty of Agriculture – IULS Iasi

no 3 Mihail Sadoveanu, Iasi, 700 490, Romania

Telephone: 0040 232 407350, fax: 0040 232 219175

E-mail: [doinaj@uaiasi.ro](mailto:doinaj@uaiasi.ro)