Plant Physiology (2nd Year, 3rd Semester)

No of transferable credits - 3

Regime of the discipline

Fundamental discipline (compulsory)

Titular of the discipline

Professor Doctor 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 horticultural 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)

Course (chapters / subchapters)
Introduction to plant physiology: definition and objectives; research methods; connections with other sciences; plant physiology in Romania.
Plant cell physiology: 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.
Water regime of plants: 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.
Plant mineral nutrition: 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
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. Gardner F., Pearce B., Mitchell R. – *Physiology of Crop Plants*, 1985, Iowa State University Press, Amer, U.S.A.
2. Jitareanu Carmenica Doina - *Vegetal Physiology*, 2002, Ion Ionescu de la Brad, Iasi
3. Jitareanu Carmenica Doina - *Plant Physiology*, 2007, Ion Ionescu de la Brad, Iasi
4. Murariu Alexandrina - *Plant Physiology*, vol 1, 2002, Junimea, Iasi
5. Toma Liana Doina, Jitareanu Carmenica Doina - *Plant Physiology*, 2007, Ion Ionescu de la Brad, Iasi
6. Toma Liana Doina, Milica C., Robu T., Jitareanu Carmenica Doina, Slabu Cristina - *Plant Physiology - laboratory guide,* 1999, Ion Ionescu de la Brad, Iasi

Final 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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Plant Physiology (2nd Year, 4th Semester)

No of transferable credits - 2

Regime of the discipline

Fundamental discipline (compulsory)

Titular of the discipline

Professor Doctor Jitareanu Carmenica Doina

The objectives of the discipline (course and practice)

The course aims to provide students with notions about the vital manifestations that characterize morphologically, biochemically and physiologically the vegetal universe, to understand the particularities of the most important physiological processes of plants: growth, development, respiration, movement and adaptability and to perceive the way the external environment may influence the vital manifestations of plants.

During practical works students are intended to acquire practical skills for the experimental demonstration of the main vital manifestations of the vegetal organism, to create the frame for teamwork and to provide an informational education in plant physiology.

Content (syllabus)

Course (chapters / subchapters)
The transformation, the circulation and the deposition of organic substances in the plant: the synthesis and the transformation of organic substances in plants; the circulation of organic substances in plants; the deposition of organic substances in plants.
Plant respiration: definition and importance; methods for determining the aerobic respiration; respiratory quotient; the physiological mechanism of respiration; types of fermentation and the mechanism of anaerobic respiration
Plant growth: cell growth stages; growth mechanism; methods of measuring growth; growth regulating substances; correlations, apical dominance, regeneration and polarity; growth movements of plants (tropism and nastic).
Plant development: the characteristics of the development cycle; determinism flowering stages; the influence of external factors on flowering; the influence of the internal factors on flowering; flowering itself; the fructification physiology
The physiology of resistance to unfavorable factors: resistance to frost and winter; droughts and heat resistance; resistance to soil salinity; resistance to infectious diseases; resistance to a polluted environment

Practical works
The transformation and circulation of organic substances in plant: the identification and transformation of carbohydrates; the identification and transformation of lipids; the identification and transformation of proteins; the circulation of the organic substances in the plant.
Aerobic respiration and fermentation: qualitative methods of studying the aerobic respiration; quantitative methods of studying the aerobic respiration; respiration's enzymes; fermentation.
Plant movements: tropism and nastic.
Final colloquium for knowledge evaluation

Bibliography

1. Jitareanu Carmenica Doina - *Vegetal Physiology*, 2002, Ion Ionescu de la Brad, Iasi
2. Jitareanu Carmenica Doina - *Plant Physiology*, 2007, Ion Ionescu de la Brad, Iasi
3. Jitareanu Carmenica Doina, Toma Liana Doina, Slabu Cristina, Marta Alina Elena – *Practical Works on Plant Physiology*, 2011, Ion Ionescu de la Brad, Iasi
4. Toma Liana Doina - *Plant Physiology*, 1998, Ion Ionescu de la Brad, Iasi
5. Toma Liana Doina, Robu T. - *Plant Physiology,* 2000, Ion Ionescu de la Brad, Iasi
6. Toma Liana Doina, Jitareanu Carmenica Doina - *Plant Physiology*, 2000, Ion Ionescu de la Brad, Iasi
7. Toma Liana Doina, Jitareanu Carmenica Doina - *Plant Physiology*, 2007, Ion Ionescu de la Brad, Iasi
8. Toma Liana Doina, Milica C., Robu T., Jitareanu Carmenica Doina, Slabu Cristina - *Plant Physiology - laboratory guide,* 1999, Ion Ionescu de la Brad, Iasi

Final 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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