

## **Plant Physiology and Biochemistry**

1. Lecturers: Tymoshenko Volodymyr Fedorovych, associate professor of the department of plant and microorganism physiology and biochemistry; Avksentyeva Olha Oleksandrivna, associate professor of the department of plant and microorganism physiology and biochemistry.
2. Status: compulsory for bachelors.
3. Course, semester: 3rd academic year, 8th semester.
4. Number of credits – 6, general academic hours – 210, including lectures – 64, laboratory practice – 48, self-study – 98.
5. Preliminary requirements: knowledge of the disciplines of natural science
6. Description of the course: course "Physiology and Biochemistry of Plants" is integrative and includes information on the physiological and biochemical aspects of a plant organism as a system of structures and functions. The course includes modern fundamental knowledge on the physiological patterns of plant cells functioning, the photosynthetic apparatus, process of plant respiration, water metabolism, mineral nutrition, plant growth and development, adaptation and plant resistance. A separate module in the course structure contains details about static (structural) plant biochemistry: (classification, structure and function of carbohydrates, proteins, aminoacids, lipids and secondary compounds), as well as biochemical processes in plants: (biochemistry of photosynthesis, respiration, mineral nutrition, biological nitrogen fixation, stability and adaptation, and metabolism of phytohormones, secondary compounds). The applied aspects of modern phytophysiology and biochemistry are highlighted.

Sections: plant cells, photosynthesis, respiration, mineral nutrition, water exchange; growth and development, plant resistance; fundamentals of plant biochemistry.

### Knowledge and skills:

- knowledge of the physiological and biochemical patterns of a plant organism functioning as a system of structures and functions, applied aspects of plant physiology and biochemistry;
  - knowledge of the place and role of plants in the biosphere and human life;
  - understanding of the fundamental importance of phytophysiology and biochemistry of plants in the formation of the overall system of ideas about living system functioning;
  - ability to apply theoretical knowledge and laboratory skills in the field of plant biology.
7. Course organization: lectures and laboratory classes (lab practice). Forms of control: tests, defense of laboratory reports and exam.
  8. Language: Ukrainian.
  9. Educational and methodological support: program, schedule of classes, educational and scientific literature, multimedia presentations, methodical complex, guidelines for laboratory practice.

### Studentbooks:

1. *Kuznetsov V.I., Dmitrieva G.A.* Plant Physiology. – Moscow: Vysshaya shkola, 2006. – 742 p.
2. *Krasilnikova L.A., Avksentyeva O.A., Zhmurko V.V.* Plant Biochemistry. – Kharkiv: V.N. Karazin Kharkiv National University, 2011. – 200 p.
3. *Musiyenko M.M.* Plant Physiology. – Kyiv: Lybid, 2005. – 808 p.
4. *Plant Physiology* / In the edition of I.P. Ermakov. – Moscow: Academia, 2007. – 640 p.
5. *Heldt H.W.* Plant Biochemistry (Russian Edition). – Moscow: BINOM, 2011. – 471 p.