Course Unit Descriptor

Study Programme: Agronomy

Course Unit Title: Antioxidants in plants and oxidative stress

Course Unit Code: 3DAI1031

Name of Lecturer(s): Prof. Boris Popović, Ass. Prof. Ružica Ždero Pavlović, Assistant MSc Bojana Blagojević

Type and Level of Studies: Doctoral Academic Degree

Course Status (compulsory/elective): Elective

Semester (winter/summer): Winter

Language of instruction: English

Mode of course unit delivery (face-to-face/distance learning): Face-to-face

Number of ECTS Allocated: 10

Prerequisites: chemistry and biochemistry

Course Aims:

The aim of the course is the acquisition of scientific skills and academic skills, develop creative skills and specific practical skills needed for the future development of the careers that are compatible with the modern developments of the discipline in the world today.

Learning Outcomes:

Developing the ability of students to follow modern achievements in science and profession, developing the ability to solve problems using scientific methods and procedures in the process of plant growing and the production of healthy food as well as developing critical and creative thinking.

Syllabus:

Theory

Introduction. Toxic forms of oxygen and nitrogen. Activated oxygen species. Reduced oxygen species. Biological effects of reduced and activated forms of oxygen. Lipid peroxidation. Toxic forms of nitrogen. Biological effects of nitric oxide. Photosynthetic organisms and protect against free radicals. Enzymes. Nonenzymatic natural antioxidants. The influence of different abiotic and biotic effects on the occurrence of oxidative stress. Hypersensitivity reaction and apoptosis. Systemic resistance and induced resistance in plants.

Practice

Determination of antioxidant enzyme activities (superoxide dismutase, catalase and peroxidase). Methods for determination of total antioxidant activity and scavenging activities of the individual radicals. Determination of malondialdehyde as a measure of intensity of lipid peroxidation. Determination of reduced glutathione, phenolics and carotenoids.

Required Reading:

1. Halliwell, B., Guteridge J.M.C. Free radicals in Biology and Medicine. Oxford, 1989.
2. Štajner, D., Popović, B. Oxidative stress in plants. Faculty of agriculture, Novi Sad, 2008.

Weekly Contact Hours:	**Lectures:**4	**Practical work:** 0

Teaching Methods:

Depending on the number of applicants, lectures and practical classes will be held or consultations and seminar

Knowledge Assessment (maximum of 100 points):			
Pre-exam obligations	points	**Final exam**	points
Test	30	Oral exam	30
Seminar	40		
The method of oral presentation and discussion. Method of presentations, demonstrations, simulations and illustrations on the board and the application of computers. Methods of practical laboratory work. Lectures, consultations, laboratory sessions, seminars.			