

Table 5.2 Course specification

Type and level of studies: Bachelor			
Course name: Ecological Biochemistry			
Course status: Elective			
Number of ECTS credits: 5			
Requirement:			
Course aim			
To learn main concepts in ecological biochemistry, and to understand the role of primary and secondary biomolecules in plant and animal adaptations to environmental factors, in their interaction, communication and co-evolution.			
To provide students with the knowledge on key concepts in ecological biochemistry. To enable students to understand the role of primary and secondary biomolecules in the adaptation of plants and animals to the environmental conditions, as well as in their mutual interactions, communication and co-evolution.			
Course outcome			
After successful completion of the course, the student is able to: (1) show understanding of biochemical basis of the adaptation of living organisms on environmental conditions, and to describe the role of biomolecules in interaction between living organisms, (2) explain relation between biological activity and ecological function of secondary biomolecules in edible, medicinal and poisonous plants (3) explain how environmental factors induce variations in chemical composition of the plant (4) demonstrate practical knowledge on methods for analysis of semiochemicals, allelochemicals, attractants, pheromones, phytoalexins in biological samples.			
Course content			
<i>Theory:</i> Biochemical basics of pollination – the role of biomolecules responsible for color and scent of flowers, nectar and pollen constituents. The biochemical bases of plants adaptation to environmental conditions (drought, flooding, low and high temperature, the toxins in the soil). Plant toxins and their function in interaction between plants and animals - detoxification mechanisms in animals. Hormonal interaction between plants and animals (phytoestrogens, insects hormones, pheromones). Secondary biomolecules as antifeedants and feeding attractants. Biochemical interactions among higher plants - allelopathy, communication between plants. Antimicrobial protection of plants. Adaptation of animals to environmental conditions. Chemical defense of animals. Biochemical agents in communication between animals - pheromones. Experimental methods in ecological biochemistry.			
<i>Practice:</i> Group work – presentations of seminar work with discussion. Fieldwork - observation of ecological processes and phenomena in nature and the collection of biological samples for chemical analysis in the laboratory. Isolation and chemical characterization of compounds with ecological significance - Analysis of pigments, volatile compounds and toxins. Watching documentary films of various phenomena in ecological biochemistry.			
Literature			
1. Harborne JB (1994): Introduction to Ecological Biochemistry, Academic Press			
2. Cardé RT, Millar JG (2004): Advances in insect chemical ecology, Cambridge University Press Cambridge, UK			
3. Barceloux DG (2008): Medical toxicology of natural substances – Foods, fungi, medicinal herbs, plants, and venomous animals, John Wiley & Sons, Inc, Hoboken, USA			
4. Wyatt TD (2003): Pheromones and animal behavior – Communication by smell and taste, Cambridge University Press, Cambridge, UK			
5. Herrmann A (2010): The chemistry and biology of volatiles, John Wiley & Sons, Ltd, Chichester, UK			
Number of classes of active teaching			Other classes
Lectures: 3	Practice: 2	OFT:	SRW:
Teaching methods			
Lectures, seminar work, field work, consultations, e-learning			
Assessment of knowledge (maximum of 100 points)			
Pre-exam obligations	Points	Final exam	points
activity during lecture classes	10	written exam	60
practical teaching	10		
seminars	20		