

COURSE DESCRIPTION

Course code	Volume in ECTS credits	Institution	Faculty	Department
MIS8023	7	ŽŪA VDU	MEF	AEI

Course title in Lithuanian

Alelopatija

Course title in English

Allelopathy

Study methods	Volume in ECTS credits
Lectures	
Consultations	
Seminars	
Individual work	

Short course annotation in Lithuanian (up to 500 characters)

Biocheminių medžiagų svarbą organizmų komunikavime; biocheminės organizmų sąveikos teoriniai pagrindai; augalų ir kitų organizmų cheminė sąveika; alelopatinės sąveikos ekosistemose; cheminės alelopatinių medžiagų grupės ir jų formos; natūralios ir kultūrinės floros rūšių biocheminė sąveika; alelopatijos reikšmė ekofiziologiniams procesams ir ekosistemų tyrime ir valdyme; organizmų cheminė sąveika - biologinės kontrolės priemonė; biocheminės sąveikos laboratoriniai ir lauko tyrimai; naujų ekologinių idėjų ir technologijų vystymas ir taikymas praktikoje.

Short course annotation in English (up to 500 characters)

Importance of biochemicals in communication between organisms; theoretical fundamentals of biochemical interaction between organisms; chemical interaction between plants and other organisms; allelopathic interactions in ecosystems; chemical groups of allelopathic substances and their forms; biochemical interaction between natural and cultural flora species; significance of allelopathy in ecophysiological processes and ecosystem research and management; the chemical interaction of organisms - a biological control tool; biochemical interaction laboratory and field studies; development and application of new eco-ideas and technologies in practice.

Relevance of the course

Allelopathy knowledge is relevant for PhD students in the field of Environment and Ecology to achieve their deeper competences and knowledge about ecosystems and their formation.

Course aims

new fundamental knowledge of biochemical interaction between organisms in ecosystems; an assessment of the importance of biochemical interactions of organisms in biodiversity and regeneration of indigenous species and ecosystems; to know the causes, conditions and levels of species migration in different ecosystems; to evaluate the impact of various environmental factors on the phenomenon of allelopathy, ecophysiology of species, establishment and biodiversity, ecosystem stability; to evaluate the influence of anthropogenic factors on biochemical interaction in natural and anthropogenic ecosystems; to adapt the ecological knowledge of biochemical interactions to the management of biodiversity in different communities in order to preserve the biodiversity of ecosystems

Content (topics) and methods

Biochemical Interactions in Ecosystems. Biochemical Interactions of Organisms in Ecosystems. Allelopathy is an obstacle to competition. Infochemicals - Mediators of biochemical interaction. Types of Alchemicals. The main groups of allelochemicals. Alelopathic Plant Interaction Plant Alelopathic Sensitivity. Chemical nature and function of plant allelopathic substances. Effects of the environment on the formation of secondary metabolites. Autotoxicity. Allelopathic interaction between plants and microorganisms. Dynamics of Alchemicals in Plants. Laboratory and field studies. Mechanisms of action and ecological significance of allelochemicals. Mechanism of chemical protection. Detoxification of xenobiotics by plants: fitoremediation. Chemical

interaction between plants and insects. Insect pheromones. Phenocenos phenomenon of allelopathy. Alelopathic effects of plant residues. Biochemical Interaction of Moners, Protists, Mushrooms, Mosses in Ecosystems Biochemical Interaction of Taxa of Different Organisms and Its Importance for Ecosystems. The role of allelopathy in the process of invading alien plants in terrestrial ecosystems. Interaction between allelopathy and abiotic and biotic stress; effect on ecophysiological processes. Consequences of ecological allelopathy.

- lectures;

- consultations (lectures can be read in case of sufficient number of PhD students)

Structure of cumulative score and value of its constituent parts

A ten-point scale and cumulative scoring scheme are applied. Self-study assignments (report on selected topic) are graded, final assessment is determined by examinations, multiplication of intermediate evaluations by weighting and product summing.

Compulsory reference materials

No.	Authors of publication, title, publishing house, year of publication.
1.	Müller-Schwarze D. 2009. Hands-On Chemical Ecology. Simple Field and Laboratory Exercises. Springer-Verlag New York. 150.
2.	Cheema Z. A., M. Farooq, A. Wahid. Allelopathy. Current Trends and Future Applications. Springer -Verlag Berlin Heidelberg, 2013.
3.	Inderjit and Mallik A.U., Eds. 2002. Chemical Ecology of Plants: Allelopathy in Aquatic and Terrestrial Ecosystems. Springer Basel AG. 273.
4.	Harborne J. B. Introduction to Ecological Biochemistry, Academic Press, 2002, 318..
5.	Lambers H., F. S. Chapin, T. L. Pons. 2008. Plant Physiological Ecology. 2008, 2nd ed. Cambridge University Press, 610.
6.	Reigosa MJ, Pedrol N, González L., eds. 2006. Allelopathy: a physiological process with ecological implications. Kluwer Academic Publishers, Netherlands, 634.
7.	Reigosa M J, Pedrol N, eds. Allelopathy from Molecules to Ecosystems. 2002. Plymouth, UK: Science Publishers, Inc.
8.	Callaway R.M. 2007. Positive Interactions and Interdependence in Plant Communities. Springer, 419.

Supplementary reference materials

No.	Authors of publication, title, publishing house, year of publication.
1.	Blum, U. Plant-plant allelopathic interactions: phenolic acids, cover crops and weed emergence. Dordrecht : Springer, 2011, 200 p.
2.	Fujii, Y. and Hiradate S. ed., 2007. Allelopathy, New Concepts and Methodology. Science Publisher, Enfield.
3.	Cardé R. T., Millar J.G. Advances in Insect Chemical Ecology. 2011, 352.
4.	Chapin, III, F. Stuart, Matson, P. A., Vitousek, P.M. Principles of Terrestrial Ecosystem Ecology. 2nd ed. Cambridge University Press, 2012, 2012, 529 p.
5.	Molisch H (1937) Der Einfluss einer Pflanze auf die andere—allelopathie. Fischer, Jena, Germany.
6.	Principles and Practices in Plant Ecology: Allelochemical Interactions. ed. K.M.M. Dakshini, C.L. Foy. Boca Raton : CRC Press, 1999. 589 p.

Course programme designed by

No.	Name, surname	Institution	Degree	E-mail address
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