|  |  |
| --- | --- |
| Course: | *Ecological biochemistry* |
| Course id: 3МЗИ1И15  |
| Number of ECTS: 6 |
| Teacher: | Prof. dr Đorđe Malenčić |
| Course status | Elective |
| Number of active teaching classes (weekly) |
| Lectures: 2 | Practical classes: 2 | Other teaching types: student`s papers (seminar) | Study research work: - | Other classes: - |
| Precondition courses | None |
| 1. Educational goal

To gain knowledge on molecular aspects of ecological characteristics of cultivated and wild growing plants. Study on secondary biomolecules in plants and their metabolism. |
| 1. Educational outcomes

The contribution of new knowledge in the field of Ecological Biochemistry. |
| 1. Course content

Theory: Biochemical adaptations of plants to environment. Plant toxins and their effect on herbivores and pathogens. Hormonal interactions between plants and animals. Secondary biomolecules which attract and repell insects. Plant-vertebrates relationship, including humans. Static and induced plants defence mechanisms from predators. Defence substances: terpenoids, alkaloids, phenolics and quinones. Alelopaty. Biochemistry of the host-parasite relation. Higher plants-lower plants interaction. Biochemical basis of plant resistance to diseases. Phytoalexins and phytotoxins. The role of chemical signals in the intra- and inter-cellular communication. Reactive species of oxygen and nitrogen. Antioxidant systems in plants and oxidative stress. Molecular mechanisms of plant resistance to abiotic stress (radiation, extreme temperatures, water stress, drought, salination, heavy metals and pesticides). Resistance mechanisms of plants to biotic stress. Induced plant stress resistance. Practical classes: Determination of content and composition of essential oils from aromatic plants. Methods of identification of essential oils. Antimicrobial properties of essential oils. Isolation i determination of total alkaloids from fruits and seeds of hot paprika. Total carotenoids determination from carrot roots. Isolation and determination of the total phenolics and tannins from different plant species. Determination of the total flavonoids using metal complex with AlCl3. Determination of phenolic pigments anthocyanins from flower petals. Hypersensitive response of plants to pathogen attack – determination of reactive oxygen species and lipid peroxidation. Field trip (collection of plant material for experimental work). |
| 1. Teaching methods

Lectures, Practical classes, Consultations, research work (optional) |
| Knowledge evaluation (maximum 100 points) |
| Pre-examination obligations | Mandatory | Points | Final exam (izabrati) | Mandatory | Points |
| Lecture attendance | Yes | 5 | Written part of the exam-tasks and theory | Yes | 60 |
| Exercise attendance | Yes | 5 |  |
| Test, Term paper | Yes | 30 |
| Literature  |
| Ord. | Author | Title | Publisher | Year |
|  | Dr Đorđe Malenčić, dr Milan Popović | Praktikum iz Biohemije biljaka (Plant biochemistry handbook) | Poljoprivredni fakultet, Novi Sad(Faculty of Agriculture, Novi Sad) | 2011. |
|  | Milan Popović, Đorđe Malenčić | Aktivni principi ukrasnog bilja (Active principles of ornamental plants) | Poljoprivredni fakultet, Novi Sad(Faculty of Agriculture, Novi Sad) | 2006. |
|  | Jeffrey B. Harborne | Introduction to Ecological biochemistry, 4th edition | Elsevier, London | 1994. |

|  |  |  |
| --- | --- | --- |
| Znak univerziteta | UNIVERSITY OF NOVI SADFACULTY OF AGRICULTURE 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 8 | Znak fakulteta2 |
| Study Programme AccreditationMASTER ACADEMIC STUDIES: SOIL SCIENCE AND PLANT NUTRITION |
| Table 5.2 Course specification |
|  |