



ЦЕНТЪР ЗА ОБУЧЕНИЕ – БАН

1000 София
ул. „Сердика“ № 4
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Basic Information:

Course Title:

Biological monitoring and/or monitoring of biological diversity

Lecturer: Yordan Uzunov, Professor Emeritus, PhD (retired)

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Total Teaching Hours: 30

Annotation:

The position and role of the monitoring as a substantial element within the management process, including environmental one, are discussed in this course. The basic steps/activities include: forecasting and planning; regulating; provisioning (financial, material, technical, staffing); controlling, monitoring and reporting. The importance of the monitoring as an independent and objective activity which provides feedback in managerial process is defined. Differences between “control” and “monitoring” are under discussion in comparison with other assessment activities such as study, investigation, survey, surveillance, observation and other specific measurements (evaluations, assessments) designed for operational purposes. Biological monitoring represents the systematic registration of the biotic responses of living systems to external impacts. The purpose of the biomonitoring is to provide regular data with the intent to use this information in quality control programs when comparing the results obtained with reference and/or standard values, for instance, biological assessment, of the state of the environment and its components as represented at all levels of organization of the life. As each monitoring system, this one of the bio-monitoring is built up also on several common fundamentals. Three main groups of methods are commonly used for biomonitoring and bio-assessments; these are species-related methods; community-related methods; and habitat-related methods. Besides two main groups of evaluations represented as an integral (result) of differential (rate) of bio-/ecological processes, there is a third group of methods/evaluations which don't deal with numerical values but have importance for registration and reporting for processes and phenomena in the living nature.

In terms of monitoring the biodiversity, the relation is likely between an object and a subject: it depends on the aims of monitoring - assessing the state of the environment by means of biological responses or the state/health of the species/populations and/or habitats. For this purpose, application of several types of biotic responses (bio-indicators, bio-monitors, biosensors, bio-accumulators) is also under discussion.

The lecture course could be suitable for upgrading knowledge of PhD students of the PhD Programmes on Hydrobiology, Zoology, Entomology Botany, Mycology, Ecology and conservation of ecosystems, and Parasitology & Helminthology. It may also be of interest to graduate students who are working on the problems of nature conservation and biodiversity within other scientific disciplines (mycology, microbiology, molecular biology, genetics, forestry, geography, agronomy, etc.).



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Course content (brief description by topics or modules)

Topic / Module 1:
Topic / Module 2:
Topic / Module 3:

Teaching and assessment methods

- Regular in-class audience;
- individual homework with literature sources;
- preparation and presentation of a monitoring project in the respective field
- presentation of the developed own project in a final seminar;
- test exam on the studied material.

Competencies acquired as a result of training (3–5 points)

- ability to formulate monitoring aims and technics necessary;
- ability to design own monitoring program and stages of realization;
- planning of necessary resources for implementation methods, financial, equipment);
- obtained data processing and summarizing the results;

Literature:

- UZUNOV, Y. 1979b. Aquatic *Oligochaeta*: a supplement to the list of limnosaprobic bioindicators. - Compt. Rend. Acad. Bulg. Sci., 32, No 8: 1101-1103.
- УЗУНОВ, Й., Е. ПОПОВА, А. ЖЕЛЕЗАРОВ, Д. БОЙЧЕВ. 1987. Информационно-програмно осигуряване на речния биомониторинг. - В: I-ва Нац. конф. пробл. биол. монитор. (Пловдив, 1987): 103-108.
- УЗУНОВ, Й., Л. КАПУСТИНА, З. ПЕТРАКОВА. 1991. Екологичната обстановка във водосбора на река Марица, оценена чрез нормирани биотични показатели. - Хидробиология, 37: 59-68.
- УЗУНОВ, Й., Е. МАТВЕЕВА. 1992. Биологична аспекти на екологичната обстановка в река Дунав. - Поканен доклад пред I Нац.конф.експ."Екогласност" (София, 1992).
- SOUFI, R., VARADINOVA, E.& Y. UZUNOV. 2004. Relation of the Bulgarian Biotic Index to the standardized indices for water quality assessment of the River Mesta (SW Bulgaria). – Compt. Rend. Acad. Sci. Bulg., 57, No 8: 83-86.
- UZUNOV, Y., S. DAKOVA & E. VARADINOVA. 2004. Complicity of flow parameters in trophic structuring the bottom invertebrate communities of the River Mesta (Southwestern Bulgaria). – BALWOIS Conference on Water Observation and Information System for Decision Support (Ohrid, May 2004): 231-232 (summary).
- UZUNOV, Y. 2011. Chapter 28. Bioindicators for ecological and environmental monitoring – In: (Millington, A., Blumer, M., MacDonald, G., Schickhoff, U. eds.) The SAGE Handbook on Biogeography, Sage Publications, London, 528-543 [ISBN 978-1-4129-1951-7].
- UZUNOV, Y. 2018. Bio-monitoring or/and monitoring of biodiversity? – Plenary report, Third Anniv. Scientific Conf. on Ecology 2018 (TASCE'2018) 30 years Depart. of Ecology & Environm. Conserv., Faculty of Biology, University of Plovdiv "Paisii Hilendarski" 2-3 November 2018, Plovdiv, Bulgaria (abstract + presentation)
- ПРИМАК, Р., Й. УЗУНОВ, Б. ГЕОРГИЕВ. 2018. Консервационна биология. Учебник за висшите училища. - С., ПЕНСОФТ, 480 стр. [ISBN 978-954-642-921-6]



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+ Current/Actual national and international (EC and UN) legislation in fields of hydrobiological monitoring and of biodiversity one as well.

Additional information (optional) (e.g., special requirements, laboratory equipment, prior knowledge)