**Study Programme: Master of Science in Biology**

**Course Unit Title: Microbiological monitoring**

**Course Unit Code: MB20**

**Name of Lecturer(s): Dragan Radnović**

**Type and Level of Studies: Master studies**

**Course Status (compulsory/elective): Elective**

**Semester (winter/summer): winter**

**Language of instruction: English, Serbian**

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

**Number of ECTS Allocated: 7**

**Prerequisites: -**

**Course Aims:** The goal of this course is to introduce the concept of indicator organisms and their importance in monitoring of different environments (air, water, soil, food, etc.), as well as introduction to methods of detection of certain indicator groups; introduction to the standards and criteria for the relevant indicator species and risk assessment.

**Learning Outcomes:** After successfully completed the pre-examination and examination commitments student will be ablr to : distinguish the different groups of indicator microorganisms, use different methods of monitoring of appropriate indicator species or groups of microorganisms properly formulate an adequate concept monitoring for analysis and evaluation of environmental quality, able to recognize hazardous situations and correctly assess the risks.

**Syllabus:**

*Theory: 1)* The concept of indicator species and/or groups of microorganisms (bacteriophages, bacteria, cyanobacteria, algae, fungi, lichens) 2) Products of microorganisms as indicators of environmental quality (enzymes, toxins etc.) 3) Monitoring of indicator microorganisms in the open and closed spaces 4) Monitoring of different groups of microorganisms as indicators of water quality (drinking waters, recreational waters etc.) 5) Monitoring of relevant indicator microorganisms in the soil 6) Microorganisms in food quality control 7) Concept of risk assessment, elements and processes (identification of hazards, routes of exposure, risk characterization

*Practice: 1)* Sampling for the purpose of detection and monitoring of various indicator microorganisms in different environment 2) Detection of certain microbial indicators in different environment using appropriate microbiological methods 3) Analysis of the environmental quality and assessment of potential risk with the use of appropriate standards and criteria.

**Required Reading:**


1. Bernd A. Markert, B.A. Markert, H.G. Zechmeister Elsevier (2003): Bioindicators & Biomonitors: Principles, Concepts, and Applications. Elsevier.
2. Maier R.M., Pepper I.L., Gerba Ch.P. (2000): Environmental microbiology. Academic press, London UK. (selected chapters)
3. Dalmacija B. (2001): Quality of recreational waters. Institute of Chemistry, Faculty of Sciences, University of Novi Sad.
4. Petrović O., Gajin S., Matavulj M., Radnović D., Sviršev Z. (1998): Microbiological investigation of surface water quality. Institute of Biology, Faculty of Sciences, University of Novi Sad.
5. Dalmacija B., Agbaba J., Klašnja M. (2009): Modern methods in the preparation of drinking water. Department of Chemistry, Faculty of Sciences, University of Novi Sad. (selected chapters)


| **Weekly Contact Hours:** | **Lectures: 2** | **Practical work: 2** |
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**Teaching Methods:** lectures, practical work, consultations

**Knowledge Assessment (maximum of 100 points):**

| **Pre-exam obligations** | points | **Final exam** | Points |
|---|---|---|---|
| Active class participation | 2 | practical exam | |
| Practical work | 18 | oral exam | 40 |
| Colloquia | 30 | ……. | |
| Seminar(s) | 10 | | |

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.