



ЦЕНТЪР ЗА ОБУЧЕНИЕ – БАН

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

Course Title: BIOLOGICAL OCEANOGRAPHY

Lecturer: assoc. prof. Kremena Stefanova

Phone:0897868561.

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Total Teaching Hours:30 academic hours.....

Annotation (up to 150 words)

The course is intended for PhD students with research interests in marine hydrobiology, ecology, and the conservation of marine ecosystems. It provides interdisciplinary theoretical and practical knowledge in the main fields of biological oceanography, including environmental conditions (abiotic factors), biological communities, biogeochemical interactions, energy flow, production and metabolism of marine ecosystems, and contemporary methodologies in biological oceanographic research. Particular emphasis is placed on the interactions between marine organisms and their environment, as well as on the structure and functioning of pelagic and benthic food webs. Special attention is given to the impacts of climate change, anthropogenic pressures, and marine pollution on ecosystem structure and functioning. Non invasive approaches to monitoring and analyzing biological processes, together with the application of oceanographic data for marine environmental management and conservation, are also discussed.

Course content (brief description by topics or modules)

Topic / Module 1: Introduction to Biological Oceanography – subject and objectives, history of the science, basic ecological concepts

Topic / Module 2: Marine Environment and Abiotic Factors – temperature, salinity, light, currents, nutrients

Topic / Module 3: Marine Organisms and Ecosystems – phytoplankton, zooplankton, nekton, benthos, biodiversity, food webs

Topic / Module 4: Multidisciplinary Foundations – chemical, physical and geological processes in the marine environment

Topic / Module 5: Contemporary Methods in Biological Oceanography – sampling; remote sensing methods, GIS, statistical processing, molecular methods

Topic / Module 6: Anthropogenic Impacts and Climate Change – eutrophication, invasive species, marine litter, climate change, etc.

Teaching and assessment methods

Teaching: 20 academic hours of lectures and 10 academic hours of seminars.

Assessment methods: Presentation on a specific topic (seminar discussion). Students are evaluated through an individual research assignment related to the topic of their PhD thesis. The assignment includes a critical review of current scientific literature, interpretation of scientific findings, and presentation of the results in the form of a seminar with a multimedia presentation followed by discussion.



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

Upon successful completion of the course, doctoral students will be able to:

- Demonstrate advanced knowledge of the structure, functioning and dynamics of marine ecosystems and the processes governing marine biodiversity.
- Develop skills for critical evaluation and analysis of contemporary scientific literature in the field of biological oceanography.
- Design and implement independent scientific research, critically analyze and interpret scientific data, and effectively present and defend research findings in an academic and professional environment.

Literature:

Miller, C.B., & Wheeler, P.A. (2012). *Biological Oceanography* (2nd ed.). Wiley-Blackwell

Lalli, C.M., & Parsons, T.R. (1997). *Biological Oceanography: An Introduction* (2nd ed.). Butterworth-Heinemann.

Levinton, J.S. (2021). *Marine Biology: Function, Biodiversity, Ecology* (6th ed.). Oxford University Press.

Mann, K.H., & Lazier, J.R.N. (2006). *Dynamics of Marine Ecosystems: Biological–Physical Interactions in the Oceans* (3rd ed.). Blackwell Publishing.

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

Participants are expected to possess basic knowledge of general ecology, hydrobiology, and the biology of marine organisms. During the seminar sessions, students are expected to demonstrate the ability to conduct an in-depth review and critical analysis of scientific literature, as well as to process, interpret, and effectively visualize scientific data and research materials.