



ЦЕНТЪР ЗА ОБУЧЕНИЕ – БАН

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

Course Title: “**Oceanology**”

Lecturer: Dimitar Petkov Dimitrov, Assoc. Professor, Ph.D.

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Total Teaching Hours: 40 academic hours: lectures – 30 hours; seminars – 10 hours

Annotation (up to 150 words)

The course "Oceanography" is the first ever edition of the Bulgarian language, which is devoted to the physical, chemical, geological and biological processes in the World Ocean, with particular emphasis on the Black Sea Exclusive Economic Zone of the Republic of Bulgaria therein.

Course content (brief description by topics or modules)

Topic / Module:

1. Subject and tasks of the Oceanology.
2. History of the study of the World Ocean and the Black Sea.
3. Origin and evolution of the World Ocean. Hypotheses for the formation of water and salt masses.
4. Geographical characteristics and division of the World Ocean. Oceans and seas.
5. Structure of oceanic and continental crust. Main elements of the bottom relief.
6. Chemical composition and salinity of sea water.
7. Physical properties of sea water.
8. Acoustic and optical properties, color and transparency of sea water.
9. Sea waves - elements, classification, transformation. Tsunamis and seiches.
10. Fluctuations in the level of the World Ocean. Tides, eustatic fluctuations, tidal - tidal phenomena.
11. Sea currents.
12. Influence of the ocean on the Earth's climate. Heat and water exchange between the ocean and the atmosphere.
13. Abrasion, accumulation, transport and sediment balance.
- 14 Types of seashores and evolution of the coastal zone.
15. Origin, composition and distribution of marine sediments.
16. Mineral resources of the bottom of the World Ocean and the Black Sea.
17. Biological processes in the ocean. Main components of the biosphere.
18. Geochronology. Stratigraphic divisions. Nomenclature.
19. Classification of sediments.
20. Deep-sea terrigenous sediments.
21. Biogenic carbonate sediments - origin and distribution.
22. Biogenic silicate sediments - origin and distribution.
23. Autogenous sediments. Metal-bearing sediments. Ferro-manganese nodules. Phosphorites.
24. Peculiarities of the sedimentary material entering the water area. Weathering. Climatic zonation.



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25. Genesis and distribution of sapropel sediments in the Black Sea.
26. Lithological and stratigraphic characteristics of Holocene sediments in the western part of the Black Sea.
27. Hypotheses for the origin of hydrogen sulfide in the Black Sea.
28. Alternative energy resources and raw material sources from the bottom of the Black Sea.

Teaching and assessment methods

Lectures, exercises, seminars, exam, test, coursework

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

1. Knowledge of the structure and relief of the seabed, analysis of sediments and mineral resources.
2. Ability to assess the state of marine ecosystems and manage biological resources.
3. Analysis of the chemical composition of seawater and pollution processes.
4. Acquisition of skills for conducting expeditionary research and using specialized equipment on board research vessels.
5. Ability to integrate data from physics, chemistry, biology and geology to solve complex environmental problems.

Literature:

- Peychev V., D. Dimitrov. 2012. Oceanology. Varna. Ongal Publishing House. ISBN 978-954-8279-82-6. 476 p., <https://doi.org/10.13140/RG.2.2.29020.49280>
<https://www.io-bas.bg/downloads/Books/Okeanologia-new.pdf>
- Dimitrov D. 2010. Geology and Non-traditional resources of the Black Sea. LAMBERT Academic Publishing. ISBN: 978-3838386393. 269 p., <https://doi.org/10.13140/RG.2.2.20631.88486>
- Petrov K., D. Dimitrov, D. Uzun. 2018. The Black Sea problem - possible solutions. LAMBERT Academic Publishing. ISBN: 978-613-9-81805-1. 112 p.
https://www.researchgate.net/publication/327395601_The_Black_Sea_problem_-_possible_solutions
- Raykov, V.; Yankova, M.; Ivanova, P.; Mihneva, V.; Dimitrov, D.P.; Stefanova, K.; Stefanova, E.; Kotsev, I.; Dzembekova, N.; Zlateva, I. 2020. Pelagic Trawl Surveys in the Bulgarian Marine Area 2017–2019; Prof. Marin Drinov Publishing House of BAS: Sofia, Bulgaria, 278 p, ISBN 978-619-245-070-0.
https://www.io-bas.bg/publications/projects_reports/PELAGIC_TRAWL_SURVEYS_IN_THE_BULGARIAN_MARINE_AREA_2017-2019.pdf
- Raykov, V.; Yankova, M.; Ivanova, P.; Mihneva, V.; Dimitrov, D.; Stefanova, K.; Zlateva, I.; Stefanova, E.; Kotsev, I.; Dzembekova, N.; Raev, Y. 2024. Pelagic surveys in the Bulgarian sector of the Black Sea 2020-2021. Dodo Books Indian Ocean Ltd, LAP Lambert Academic Publishing, London, UK, ISBN:978-620-5-51494-8, 156. <https://www.amazon.com/Pelagic-Surveys-Bulgarian-Sector-2020-2021/dp/620551494X>
- Raykov, Violin; Ivanova, Petya; Zlateva, Ivelina; Dimitrov, Dimitar; Markó, Csaba; Hankó, Gergely; Wégner, Krisztina; Robinson, Miroslava; Hazuchová, Katarína; Kiraľvargová, Henrieta; Obersteiner, Gudrun; Mária, Hidi; László, Bokor. (2021). SURVEY - National Legislative



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System on Surface Water Quality. Publisher: Ongal, Institute of Oceanology - Bulgarian Academy of Sciences (IO-BAS), Hungarian Association of Environmental Enterprises (HAEE). ISBN: 978-619-258-023-0. 115 p.

<https://io-bas.bg/downloads/2022/Final%20National%20International%20survey.pdf>

[https://www.researchgate.net/publication/367313627_SURVEY_-_](https://www.researchgate.net/publication/367313627_SURVEY_-_National_Legislative_System_on_Surface_Water_Quality)

[National Legislative System on Surface Water Quality](#)

SHEPARD, Francis P. 1973. *Submarine Geology*. 3rd ed. New York: Harper & Row, 517 p. ISBN: 0-06-046091-1

Kennett, J. P. 1982. *Marine Geology*. Prentice-Hall. ISBN: 978-0135569368

Oceanology. 1979. Moscow, vol. 1-10. (In Russian)

Rozhdestvenski A. 1980. Hydrochemistry of the Bulgarian Sector of the Black Sea. Sofia. BAS. (in Bulgarian)

Popov V., K. Mishev. 1974. Geomorphology of the Bulgarian Black Sea Coast and Shelf. Academic Publishing House "Prof. Marin Drinov", 268 p. (in Bulgarian)

Dimitrov P., D. Dimitrov. 2003. The Black Sea, The Flood and the ancient myths. Publishing House "Slavena", Varna, ISBN: 954-579-335-X, c. 89. <https://doi.org/10.13140/RG.2.2.18954.16327>

Geography of Bulgaria. Physical Geography. Geoinformation Technologies. 2025. Academic Publishing House "Prof. Marin Drinov", Sofia, ISBN: 9786192455309. 600 p. (in Bulgarian)

Geological History of the Black Sea Based on Deep-Sea Drilling Results. 1980. Moscow, Nauka, 200 p. (in Russian)

Geology and Hydrology of the Western Black Sea. 1979. Bulgarian Academy of Sciences, Sofia, 292 p. (in Russian)

Geological and Geophysical Studies of the Bulgarian Sector of the Black Sea. 1980. Bulgarian Academy of Sciences, Sofia, 318 p. (in Russian)

Geological Evolution of the Western Black Sea Basin in the Neogene-Quaternary. 1990. Bulgarian Academy of Sciences, Sofia, 666 p. (in Russian)

Geomorphology and Paleogeography of the Shelf. 1978. Moscow, Nauka, 233 p. (in Russian)

Geochemistry of Late Cenozoic Sediments of the Black Sea. 1982. Moscow, Nauka, 241 p. (in Russian)

Dimitrov P., A. Stoyanov. 1984. Ferro-manganese nodules of the western part of the Black Sea shelf. In: Study of the geological history and processes of modern sedimentation of the Black and Baltic Seas, 2; Kyiv, Naukova Dumka; 2–6. (in Russian)

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

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