

Subject card

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| Subject name and code | Physical oceanography - laboratory classes , PG_00131474 | | | | | | |
| Field of study | Marine Hydrography | | | | | | |
| Date of commencement of studies | October 2024 | Academic year of realisation of subject | | | 2025/2026 | | |
| Education level | Bachelor's studies | Subject group | | | Obligatory subject group in the field of study Subject group related to practical vocational preparation | | |
| Mode of study | full-time studies | Mode of delivery | | | at the university | | |
| Year of study | 2 | Language of instruction | | | Polish | | |
| Semester of study | 3 | ECTS credits | | | 3.0 | | |
| Learning profile | practical | Assessment form | | | credit | | |
| Conducting unit | Laboratory of Physical Oceanography -> Department of Physical Oceanography and Climate Research -> Faculty of Oceanography and Geography -> Rector | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr inż. Grzegorz Cerkowniak | | | | |
| | Teachers | | dr inż. Grzegorz Cerkowniak | | | | |
| Lesson types | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 0.0 | 0.0 | 45.0 | 0.0 | 0.0 | 45 |
| | E-learning hours included: 0.0 | | | | | | |
| Learning activity and number of study hours | Learning activity | Participation in didactic classes included in study plan | | Participation in consultation hours | | Self-study | SUM |
| | Number of study hours | 45 | | 3.0 | | 30.0 | 78 |
| Subject objectives | <p>To know and understand:</p> <ul style="list-style-type: none"> • spatial and temporal variation of temperature, salinity and density of seawater and the processes that shape this variation • basic dynamic processes in the sea (forces acting on water masses in the sea, geostrophic currents, Ekman theory, mixing, wind waves) • fundamentals of marine acoustics (sound propagation and refraction in the sea; sound channel) | | | | | | |

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| Learning outcomes | Course outcome | Subject outcome | Method of verification |
| | [HML3-U08] independently use the professional literature available in traditional and electronic form, make an assessment, critical analysis and synthesis as well as the correct interpretation of the information obtained | He/she is able to independently use the professional literature on physical oceanography available in traditional and electronic forms, evaluate, critically analyze and synthesize, and correctly interpret the acquired information. | [SU5] implementation of a problem task |
| | [HML3-U14] use the applicable terminology in presenting and discussing problems related to the field of study | He/she is able to use the applicable terminology in presenting and discussing problems in physical oceanography. | [SU3] text preparation/written work |
| | [HML3-K01] correctly identify and resolve professional dilemmas, especially in the aspects of security and entrusted property | He/she can plan and complete tasks in a timely manner during individual and team work. He/she is able to correctly identify and resolve dilemmas related to exercise performance. | [SK5] implementation of a problem task |
| | [HML3-W04] the issue of measurements related to the exploration of sea basins and inland waters and tools allowing to describe, interpret and present the results of measurements | He/she knows and understands the methods, techniques and research tools used in the physical study of the seas and oceans | [SW5] implementation of a problem task |
| Subject contents | <ol style="list-style-type: none"> 1. Visualization of oceanographic data (Ocean data Vlew program). 2. Spatial and temporal variability of salinity, temperature and density of seawater. Thermocline and halocline. 3. T-S diagrams. Water masses. 4. Vertical stability of water masses, Väisälä-Brunta parameter. 5. Mixing, differential diffusion of heat and salt, salt fingers. Turner's angle. 6. Sound propagation in the sea. Sound channel. Wind currents, Ekman theory, upwelling and downwelling. 7. Geostrophic currents. Dynamic method. 8. Wind waves. | | |
| Prerequisites and co-requisites | | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | reports from exercises, colloquium | 51.0% | 100.0% |
| Recommended reading | Basic literature | <ol style="list-style-type: none"> 1. Talley i in., 1996, Descriptive Physical Oceanography. An Introduction, Elsevier, https://booksite.elsevier.com/DPO/. 2. Stewart, R.H., 2008, Introduction to physical oceanography; https://open.umn.edu/opentextbooks/textbooks/20. 3. Duxbury, A.B. Duxbury A.C., Sverdrup, K.A., 2002, Oceany świata, PWN, 636s. | |
| | Supplementary literature | <ol style="list-style-type: none"> 1. Lisicki A., 1996, Plywy na morza i oceanach, GTN, 129s. 2. Mellor G., 1996, Introduction to physical oceanography, Am. Inst. Phys., 258s. 3. Massel S., 2010, Procesy hydrodynamiczne w ekosystemach morskich, Wyd. Univ. Gda., 495s. | |
| | eResources addresses | | |
| Example issues/ example questions/ tasks being completed | <p>Using data from World Ocean Atlas 2018:</p> <ol style="list-style-type: none"> 1. Prepare vertical graphs of temperature $T(z)$ and salinity $S(z)$ for three selected stations (A, B, C) located along a given longitude in a given season (or month). Label the profiles of individual stations with the letters: A, B and C. 2. Prepare contour maps of temperature T and salinity S at the sea surface ($z = 0$) in a given area in a given season (or month). | | |

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