

**Subject card**

Subject name and code	, PG_00120320						
Field of study	Oceanography						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2025/2026		
Education level	postgraduate studies	Subject group			Obligatory subject group in the field of study Optional subject group		
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			2.0		
Learning profile	academic	Assessment form					
Conducting unit	Katedra Ekologii Morza -> Faculty of Oceanography and Geography						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Mariusz Sapota				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	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	30		5.0		15.0	50
Subject objectives	Presentation of issues related to the exploitation of marine biological resources, its history and prospects						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[OCEANMU2-W06] knows and identifies potential threats to the marine environment on a local and global scale resulting from strong anthropopressure, predicts their effects on various time and space scales		knows the importance of marine living resources and identifies potential threats to the marine environment resulting from the exploitation of these resources, on a local (Baltic) and global scale		[SW4] test/exam - oral or written		
Subject contents	<ul style="list-style-type: none"> <li>The concept of marine living resources and their distinguishing features. Comparison of mariculture and direct exploitation of natural resources. Methods of breeding marine organisms with particular emphasis on bivalve molluscs and crustaceans.</li> <li>Fishing techniques for marine organisms and fishing gear used.</li> <li>Methods of studying the structure, determining the size of exploited populations and determining the allowable amount of catches.</li> <li>Legal and economic basis for the exploitation of marine living resources. Principles of administration of the exploitation of marine biological resources.</li> <li>Products obtained from marine organisms. Genetically modified products and transgenic organisms. Biofuels produced from marine organisms as an alternative source of energy.</li> <li>Use of marine biological resources for non-food purposes. The cultural significance of invertebrates as tools of everyday use.</li> </ul>						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	exam		51.0%		100.0%		

Recommended reading	Basic literature	<p>Chrzan F., 1979, Przyrodnicze podstawy rybołówstwa morskiego, Wyd. Uniwersytetu Gdańskiego, Gdańsk</p> <p>Costa-Pierce B.A., 2002. Ecological Aquaculture. Blackwell Science, Oxford, UK.</p> <p>Encyklopedia Geograficzna Świata tom VII Oceany i Morza, OPRES Kraków 1997</p> <p>FAO World Agricultural Information Centre. Yearbook Statistics Fishery Commodities FAO Rome</p> <p>Global Aquaculture Production Fishery Statistical Collections, 2011. FAO, Rome.</p> <p>Gutkowski B., Witoński M., 2009. Polskie Sieci Morskie - infrastruktura przesyłowa niezbędna dla rozwoju farm wiatrowych w polskich obszarach morskich. Przyszłe wykorzystanie polskiej przestrzeni morskiej dla celów gospodarczych i ekologicznych. Instytut Morski w Gdańsku. Gdańsk.</p> <p>Harris R. (ed.), 2005. ICES Zooplankton Methodology Manual. Elsevier Academic Press.</p> <p>Hoff F.H., Snell T.W., 1987. Plankton culture manual. Florida Aqua Farms Inc.</p> <p>Huner, J. V., Brown E. E. (eds.), 1985. Crustacean and Mollusk Aquaculture in the United States. AVI Publishing Co., Westport, Connecticut.</p> <p>Imai T., 1980. Aquaculture In Shallow Seas: Progress In Shallow Sea Culture, A. A. Balkema/ Rotterdam.</p> <p>Klekowski R. Z., Fischer Z. (red.), 1993. Bioenergetyka ekologiczna zwierząt zmiennoocieplnych, PAN, Wydział II Nauk Biologicznych, Warszawa.</p> <p>Lavens P., Sorgeloos P., 1996. Manual of the production and use of live food for aquaculture. FAO Fisheries Technical Paper No 361.</p> <p>Lee C.S, OBryen P., Marcus N., 2005. Copepoda In Aquaculture. Wiley-Blackwell.</p> <p>Moksness E., Kjorsvik E., Olsen Y., 2004. Culture of Cold-water Marine Fish. Blackwell.</p> <p>Muzzarelli R.A.A., Peter M.G., 1997. Chitin Handbook. Atec Edizioni, Grottammare, Italy.</p> <p>Omori M., Ikeda T., 1992. Methods in Marine Plankton Ecology. Krieger Publ. Comp. Malabar, Floryda</p> <p>Reich G., 1970. Kolagen. Zarys Metod, Wyniki i Kierunki Badania. Wydawnictwa Naukowo-Techniczne, Warszawa.</p> <p>Rutkiewicz S., 1970, Zasoby morza i człowiek, Wydawnictwo Morskie, Gdańsk</p> <p>Sikorski Z.E., 1992, Morskie Surowce Żywnościowe, Wyd. NT, Warszawa.</p> <p>Stickney R.R. (ed.), 2000. Encyclopedia of Aquaculture. John Wiley&amp;Sons, Inc.</p> <p>Świniarski J, Cetinic P, 1993. Technologia połowu organizmów morskich, Wydawnictwo Morskie Gdańsk Winberg G.G., 1971. Methods for the estimation of production of aquatic animals. Academic Press, London, U.K.</p> <p>Costa-Pierce B.A., 2002. Ecological Aquaculture. Blackwell Science, Oxford, UK.</p> <p>Cushing D.H. 1975 Marine Ecology and Fisheries. Cambridge University Press Cambridge</p> <p>Harden Jones F.R. 1970 Fish Migration, Edward Arnold (Publishers) Ltd. London</p> <p>History of Aquaculture, 2009. FAO, United Nations.</p> <p>Wojnikanis-Mirski W.N., 1954. Narzędzia połowu rybołówstwa przemysłowego, Wydawnictwa Komunikacyjne, Warszawa</p> <p>The Encyclopedia of Marine Resources 1969 Frank E. Firth Reinhold Company London</p> <p>Świniarski J, Kepa J., 1975. Teoria łowności I projektowanie narzędzi połowu, PWN Warszawa</p>
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	Supplementary literature	<p>Andersen, R.A. (ed.). 2005. Algal Culturing Techniques. Elsevier Academic Press, London, 578 str.</p> <p>Beiras R., Camacho A.P., Albentosa M., 1994. Comparison of the scope for growth with the growth performance of <i>Ostrea edulis</i> seed reared at different food concentrations in an open-flow system. <i>Mar. Biol.</i> 119, 227-233.</p> <p>Davis F.M., 1958. An account of the fishing gear of England and Wales, HMSO, London</p> <p>Grant J., Cranford P.J., 1991. Carbon and nitrogen scope for growth as function of diet in the sea scallop <i>Placopecten magellanicus</i>. <i>J. Mar. Biol. Assoc. U.K.</i> 71, 437-450.</p> <p>Guerin J.L., Stickle W.B., 1992. Effects of salinity on the tolerance and bioenergetics of juvenile blue crabs (<i>Callinectes sapidus</i>) from waters of different environmental salinities. <i>Mar. Biol.</i> 114, 391396.</p> <p>Pusceddu A., Frascchetti S., Mirto S., holmer M., Danovaro R., 2007. Effects of intensive mariculture on sediment biochemistry. <i>Ecological Applications</i> 17(5), 13661378.</p> <p>Richmond A., 2004. Microalgal Culture Biotechnology and Applied Phycology. Blackwell Science.</p> <p>Riisgård H.U., Randlow A., 1981. Energy budgets, growth and filtration rates in <i>Mytilus edulis</i> at different algal concentrations. <i>Mar. Biol.</i> 61, 227-234.</p> <p>Rutkowicz S. 1982. Encyklopedia ryb morskich, Wydawnictwo Morskie Gdańsk</p> <p>Saoud P.I., Anderson G., 2004. Using scope-for-growth estimates to compare the suitability of feeds used in shrimp aquaculture. <i>Journal of the World Aquaculture Society</i> 35 (4), 523-528.</p>
	eResources addresses	<p>Podstawowe</p> <p><a href="https://www.fao.org/fishery/en/fishstat">https://www.fao.org/fishery/en/fishstat</a> - word fishery data</p> <p><a href="https://www.ices.dk/data/assessment-tools/Pages/stock-assessment-graphs.aspx">https://www.ices.dk/data/assessment-tools/Pages/stock-assessment-graphs.aspx</a> - Baltic stock assesment</p> <p>Adresy na platformie eNauczanie:</p>
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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