

**Subject card**

<b>Subject name and code</b>	Systematics and basic biology of cultivated organisms - laboratory exercises, PG_00075891						
<b>Field of study</b>	Aquaculture – Business And Technology						
<b>Date of commencement of studies</b>	October 2024		<b>Academic year of realisation of subject</b>		2024/2025		
<b>Education level</b>	undergraduate studies		<b>Subject group</b>				
<b>Mode of study</b>	full-time studies		<b>Mode of delivery</b>		at the university		
<b>Year of study</b>	1		<b>Language of instruction</b>		Polish		
<b>Semester of study</b>	2		<b>ECTS credits</b>		6.0		
<b>Learning profile</b>	practical		<b>Assessment form</b>				
<b>Conducting unit</b>	Faculty of Oceanography and Geography						
<b>Name and surname of lecturer (lecturers)</b>	Subject supervisor		dr Anna Dziubińska				
	Teachers						
<b>Lesson types</b>	<b>Lesson type</b>	<b>Lecture</b>	<b>Tutorial</b>	<b>Laboratory</b>	<b>Project</b>	<b>Seminar</b>	<b>SUM</b>
	<b>Number of study hours</b>	0.0	0.0	90.0	0.0	0.0	90
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	<b>Participation in didactic classes included in study plan</b>	<b>Participation in consultation hours</b>	<b>Self-study</b>	<b>SUM</b>		
	<b>Number of study hours</b>	90	20.0	50.0	160		
<b>Subject objectives</b>	The aim of the course is to familiarize students with the systematics and basic concepts of the biology of various groups of aquatic organisms used in aquaculture.						
<b>Learning outcomes</b>	<b>Course outcome</b>	<b>Subject outcome</b>		<b>Method of verification</b>			
	[AKWAL3-U02] can make observations and perform simple physical / biological / chemical measurements that are typical in socio-economic activity based on natural sciences	Can conduct observations and perform simple biological measurements and analyses of various groups of organisms used in culture, i.e., plants and algae, invertebrates, and fish.		[SU6] demonstration of practical skills [SU8] observation of student's independent or team work			
	[AKWAL3_W03] knows and understands the conceptual categories and terminology related to the biological basis of aquatic organisms breeding, as well as concepts directly relevant to the practical applications of this knowledge	Knows and understands concepts related to the systematics and biology of cultured plants and algae, invertebrates, and fish, with direct reference to the practical applications of this knowledge.		[SW4] test/exam - oral or written			
	[AKWAL3-K03] is ready to follow the ethical principles in biological research and adhere to the principles of intellectual honesty	Is ready to adhere to ethical principles in research on various groups of organisms used in aquaculture and to uphold intellectual honesty.		[SK3] text preparation/written work [SK8] observation of student's independent or team work			

Subject contents	<p><b>Plants and Algae:</b></p> <ol style="list-style-type: none"> <li>1. Understanding the morphological structure of representatives of different taxonomic groups of cyanobacteria and algae.</li> <li>2. Identification of species in microphytobenthos and phytoplankton samples.</li> <li>3. Description of the morphological structure and identification of macroalgae.</li> </ol> <p><b>Invertebrates:</b></p> <ol style="list-style-type: none"> <li>1. Understanding the morphological and anatomical structure of organisms from different groups.</li> <li>2. Identification of species based on taxonomic characteristics.</li> <li>3. Understanding basic aspects of reproductive biology.</li> <li>4. Observations of inter-individual interactions.</li> </ol> <p><b>Fish:</b></p> <ol style="list-style-type: none"> <li>1. Systematic features of fish: body shape, head, fins, types of caudal fins, types of scales, lateral line.</li> <li>2. Internal anatomy of fish.</li> <li>3. Practical familiarity with selected fish species: Salmoniformes, Anguilliformes, Cypriniformes, Perciformes, Pleuronectiformes.</li> </ol>														
Prerequisites and co-requisites															
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="456 1249 794 1272">Subject passing criteria</th> <th data-bbox="799 1249 1137 1272">Passing threshold</th> <th data-bbox="1142 1249 1481 1272">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="456 1279 794 1328">test or assignment from the part: Plants and Algae</td> <td data-bbox="799 1279 1137 1328">51.0%</td> <td data-bbox="1142 1279 1481 1328">33.0%</td> </tr> <tr> <td data-bbox="456 1335 794 1384">test or assignment from the part: Fish</td> <td data-bbox="799 1335 1137 1384">51.0%</td> <td data-bbox="1142 1335 1481 1384">33.0%</td> </tr> <tr> <td data-bbox="456 1391 794 1440">test or assignment from the part: Invertebrates</td> <td data-bbox="799 1391 1137 1440">51.0%</td> <td data-bbox="1142 1391 1481 1440">34.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	test or assignment from the part: Plants and Algae	51.0%	33.0%	test or assignment from the part: Fish	51.0%	33.0%	test or assignment from the part: Invertebrates	51.0%	34.0%
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Recommended reading	Basic literature	<p><b>Literature used during classes:</b></p> <p>Błaszak C. (red.), 2021. Zoologia Szkarłupnie płazy Tom 3 Część 1. Wydawnictwo Naukowe PWN.</p> <p>Brusca R.C., Moore W., Shuster S.M., 2016. Invertebrates, 3rd Edition, Sinauer Associates.</p> <p>Barnes R.S.K., Calow P., Olive P.J.W., Golding D.W., Spicer J.I., 2007. The Invertebrates, A Synthesis. 3rd Edition, Blackwell Publishing.</p> <p>Moraczewski J., Riedel W., 1976. Ćwiczenia z zoologii bezkręgowców, PWN.</p> <p>Pechenik J.A., 2014. Biology of the Invertebrates, 7th Edition, McGraw-Hill Education.</p> <p>Szweykowska A., Szweykowski J. 1974, 1993. Botanika Systematyka, PWN, Warszawa.</p> <p>Szweykowska A., Szweykowski J., 1974, 1993. Botanika Morfologia, PWN Warszawa.</p> <p>Kadłubowska J. Z., 1975. Zarys algologii, PWN, Warszawa.</p> <p>Brylińska M., 2000. Ryby słodkowodne Polski. Wydawnictwo Naukowe PWN Warszawa.</p> <p>Gerstmeier R., Romig T., 2002. Przewodnik. Słodkowodne ryby Europy. Mulico Warszawa.</p> <p>Bieniarz K., Epler P., 2004. Zoologia Tom V, Ryby. Leksykon popularnonaukowy. Wydawnictwo Albatros, Kraków.</p> <p>Nelson J.S., 2006. Fishes of the World. Wiley</p> <p>Kottelat M., Freyhof J., 2007. Handbook of European Freshwater Fishes.</p> <p><b>Literature used for independent study:</b></p> <p>Grabda E., 1986. Zoologia. Bezkręgowce, PWN.</p> <p>Moore J., 2009. Wprowadzenie do zoologii bezkręgowców, Wydawnictwa Uniwersytetu Warszawskiego.</p> <p>Moraczewski J., Riedel W., 1976. Ćwiczenia z zoologii bezkręgowców, PWN. Pliński Marcin - Glony Zatoki Gdańskiej, część I-VII - Uniwersytet Gdański, 1980.</p> <p>Gąsowska M., 1962. Kragłouste i ryby. Państwowe Wydawnictwo Naukowe, Warszawa.</p> <p>Grodziński Z., 1981. Anatomia i embriologia ryb. Państwowe Wydawnictwo Rolnicze i Leśne, Warszawa.</p>
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	Supplementary literature	<p><b>Supplementary literature:</b></p> <p>Błaszak C. (red.), 2012. Zoologia Tom 2 część 2 Stawonogi, Wydawnictwo Naukowe PWN.</p> <p>Błaszak C. (red.), 2016. Zoologia bezkręgowce Tom 1 część 2, Wtórnojamowce (bez stawonogów). Wydawnictwo Naukowe PWN.</p> <p>Jura Cz., 1997. Bezkręgowce, PWN. Lee R.E. - Phycology - Cambridge Univ. Press, Cambridge, 1998.</p> <p>Hoek C. van den, Mann D.G., Jahns H.M., 1998. Algae, An introduction to phycology, Cambridge Univ. Press, Cambridge.</p> <p>Humm H. J., Wicks S. R., 1990. Introduction and guide to marine bluegreen algae, J. Wiley &amp; Sons, New York.</p> <p>Kumar H.D., 1999. Introductory Phycology, EWP Affiliated East-West Press Private Limited. Bone</p> <p>Q.M.A., Marshall N.B., 1982. Biology of fishes. Blackie. Glasgow and London.</p> <p>Cailliet G.M., Love M.S., Ebeling A.W., 1986. Fishes. Wadsworth Publishing Company, Belmont, California.</p> <p>Lagler K.F., Bardach J.E., Miller R.R., May Passino D.R., 1977. Ichthyology. John Willey &amp; Sons. New York, Chichester, Brisbane, Toronto</p>
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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