

Subject card

Subject name and code	Marine Vertebrate Ecology, PG_00154785						
Field of study	Natural Resources Conservation						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2025/2026		
Education level	Bachelor's studies		Subject group				
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		English		
Semester of study	6		ECTS credits		2.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Laboratory of Molecular Evolution and Bioinformatics -> Department of Evolutionary Genetics and Biosystematics -> Faculty of Biology -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Andre Viola De Moura				
	Teachers		dr hab. Andre Viola De Moura				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	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	15		3.0		32.0	50
Subject objectives	- Understand the basic physical/chemical patterns and processes of the marine environment - Identify key marine vertebrate groups, and understand their unique and common characteristics - Understand unique characteristics of marine vertebrate ecology - Understand how analytical techniques and tools to understand key patterns and processes in marine biology and ecology - Identify key conservation threats to the marine environment, and understand key techniques and challenges of implementing mitigation measures						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[OZPL3_K01] The graduate is ready to recognise the limitations in his/her own knowledge and understands the need for continuous learning and development	- recognizes the limitations of own knowledge of marine environment ecology and understands the need for continuous learning and development	[SK4] test/exam - oral or written
	[OZPL3_U13] The graduate is able to speak a foreign language at B2 level, using specialised vocabulary	- speaks English at Level B2, using specialist vocabulary in marine ecology in scientific discussion	[SU4] test/exam - oral or written
	[OZPL3_U10] The graduate is able to use a specialised Polish and foreign language in a way that is understandable and accessible to both specialists and non-specialists	- speaks English at Level B2, using specialist vocabulary in marine ecology in scientific discussion	[SU4] test/exam - oral or written
	[OZPL3_U07] The graduate is able to draw correct conclusions on the basis of analysis and synthesis of data from various sources	- draws correct conclusions based on the analysis and synthesis of data from various sources on structure, function, key patterns, and processes in marine environment	[SU4] test/exam - oral or written
	[OZPL3_K08] The graduate is ready to systematically update his/her natural knowledge and to apply it in practice	- systematically updates the knowledge of marine environment ecology and knows its practical applications	[SK4] test/exam - oral or written
	[OZPL3_W06] The graduate has an advanced understanding of the names and types of natural environments, including their structural and functional characteristics	- understands the names and types of natural environments, including their structural and functional characteristics	[SW4] test/exam - oral or written
	[OZPL3_W13] The graduate has an advanced understanding of the fundamental rules, methods, and techniques of environmental research and their potential applications in nature conservation	- knows basic analytical techniques and methods enabling studies and protection of vertebrates in marine environment	[SW4] test/exam - oral or written
	[OZPL3_W14] The graduate understands the relationship between the achievements of natural sciences and their potential applications in socio-economic contexts, while considering the sustainable use of biodiversity	- understands the relationship between fundamental ecological processes and the principles of sustainable use of marine environment resources	[SW4] test/exam - oral or written
Subject contents	1. Basic oceanography and marine geography 2. Biology and ecology of fish inhabiting marine environment 3. Biology and ecology of reptile, bird and mammalian species inhabiting marine environment 4. Evolution of vertebrates in the marine environment 5. Dispersal in the marine environment, and how to integrate ecology and oceanography 6. Ecological niche modelling in the marine environment 7. Marine conservation challenges, including pollution, climate change and overfishing 8. Case studies based on current research		
Prerequisites and co-requisites	English at level B2		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written exam; in the case of resit exam – it is oral test	51.0%	100.0%

Recommended reading	Basic literature	Kaiser MJ, Attrill MJ, Jennings S, Thomas DN, Barnes DKA, Brierley AS, Hiddink JG, Kaartokallio H, Polunin NVC, Raffaelli DG (2011). <i>Marine Ecology: Processes, Systems, and Impacts</i>. OUP Oxford. ISBN 0199227020 Thomas D, Bowers DJ (2012). <i>Introducing Oceanography</i>. Dunedin Academic Press. ISBN 1780460015 Helfman G, Collette BB, Facey DE, Bowen BW (2009). <i>The Diversity of Fishes: Biology, Evolution, and Ecology</i>. Wiley-Blackwell. ISBN 1405124946 King M (2007). <i>Fisheries Biology, Assessment and Management</i>. Wiley-Blackwell. ISBN 140515831X Hoelzel AR (2002). <i>Marine Mammal Biology: an Evolutionary Approach</i>. Wiley-Blackwell. ISBN 0-632-05232-5 Ray GC, McCormick-Ray J, Smith Jr RL (2013). <i>Marine Conservation: Science, Policy, and Management</i>. Wiley-Blackwell. ISBN 1405193476
	Supplementary literature	Natoli A, Moura AE, Sillero N (2022) Citizen science data of cetaceans in the Arabian/Persian Gulf: Occurrence and habitat preferences of the three most reported species. <i>Mar Mammal Sci</i> 38:235255. doi: 10.1111/MMS.12865 Moura AE, Shreves K, Pilot M, Andrews KR, Moore DM, Kishida T, Möller L, Natoli A, Gaspari S, McGowen M, Chen I, Gray H, Gore M, Culloch RM, Kiani MS, Sarrouf Willson M, Bulushi A, Collins T, Baldwin R, Willson A, Minton G, Ponnampalam L, Rus Hoelzel A (2020) Phylogenomics of the genus <i>Tursiops</i> and closely related Delphininae reveals extensive reticulation among lineages and provides inference about eco-evolutionary drivers. <i>Mol Phylogenet Evol</i> 146:106756. doi: 10.1016/j.ympev.2020.106756
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Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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