

	Department: Ecology, agronomy and aquaculture Study programme: Underwater science and technology
Description of the study programme	The study of underwater science and technology is an interdisciplinary study, and it is new not only for Croatia but also for the whole Mediterranean. Croatia has a long and developed coastline, and as a country is economically and culturally dependent on the sea. Numerous activities are related to the underwater work and technology, including construction projects on coastal and marine structures, marine industry, aquaculture, activities related to protection of the environment (sea and coastal areas), and underwater archaeology. All of these jobs require skilled labor, which is lacking in the Croatian labor market. Training people who currently perform such tasks is mainly a military and non-institutional or informal, therefore in both cases there is no higher education level with formal qualifications. The study will enable students to be self-organizing complex underwater tasks and activities, and will be able to communicate with experts from various fields such as biology, ecology, aquaculture, archeology, shipbuilding, construction, offshore engineering, environmental protection, coastal management and business and diving. It is therefore important that this study, except for diving training and other than specific knowledge in these areas, has a special emphasis on protecting our seas and marine environment, as one who performs underwater work of any kind must be aware of the potential impact of its activities on the environment and ways to protect environment of these effects. It is also important that the diver training is not mandatory, so that all those who wish to gain knowledge of the underwater science and technology, but for whatever reason (eg health) can not or does not want to dive.
Learning outcomes of the study programme	The study will enable students to be self-organizing complex underwater tasks and activities, and will be able to communicate with experts from various fields such as biology, ecology, aquaculture, archeology, shipbuilding, construction, offshore engineering, environmental protection, coastal management and business and diving. It is therefore important that this study, except for diving training and other than specific knowledge in these areas, has a special emphasis on protecting our seas and marine environment, as one who performs underwater work of any kind must be aware of the potential impact of its activities on the environment and ways to protect environment of these effects. It is also important that the diver training is not mandatory, so that all those who wish to gain knowledge of the underwater science and technology, but for whatever reason (eg health) can not or does not want to dive. Upon graduation, students will be able to: - use mathematical modeling - apply statistical methods - use computer aided engineering - recognize main archaeological sites and determine their archaeological potential - explain problems of research methodology and protection of archaeological sites - date (approximately) underwater archaeological sites

	- determine category of archaeological sites and estimate necessity for their conservation - solve problems in different areas based on the understanding of main physical processes which govern hydrographic properties and ocean dynamics in the Adriatic - choose optimal construction materials and optimal building technology of for particular underwater construction - choose optimal structure and structural elements of for particular offshore and underwater building - estimate effects of coastal and underwater construction on the environment - recognize negative influence of fresh-water and marine environment on the construction materials and suggest protection methods - Anticipate and categorize possible problems and threats to the environment based on their knowledge on biological processes and organisms. - propose methods to prevent pollution of freshwater and marine environment and processes of pollution recovery - classify diversity and various life styles of marine organisms, and describe their adaptations to different environmental conditions - describe and explain differences of large marine living areas like: open sea, coastal areas, deep sea, coral reefs, and estuaries - choose culture system according to biological characteristics of cultivated - predict and resolve coastal management problems - apply scientific methods to solve practical problems - perform underwater activities safely, respecting legislations and regulations - select appropriate support system for underwater operations - collect, analyze and interpret scientific data - present scientific results clearly and briefly in written and oral form - plan project approach to the problems and situations in domestic and international development and economical projects, which take into consideration implementation of methods and tools characteristic for underwater science and technology - establish and maintain relationship of mutual cooperation, communication and compromise during the project - independently manage the part of the project assigned to him/her
List of courses offered in a foreign language in winter term (by semesters)	- Numerical Methods - General Biology - Marine Ecology - Pollution of Aquatic Systems - Biomimicry - Marine protection and conservation
List of courses offered in a foreign language in summer term (by semesters)	- Fundamental scientific skills - Marine Biology - Methods in underwater science and technology - Coasts and Communities– applied biomimicry - Final thesis
Description of the courses offered in a foreign language	
1. Name of the	Numerical Methods

course							
Number of ECTS credits	6	Manner of implementation of the study programme	2	2	2	Semester 1	
Description of the course	This course aims are to teach basic numerical methods to analyze a finite set of experimental data (arising for example in physics, chemistry, biology, economics). Students will be proficient in the use of statistical methods under application of the statistical program R.						
Learning outcomes of the course	- use mathematical modelling - select and apply appropriate statistical methods - use computer aided data analysis (R) - apply scientific methods to solve practical problems - collect, analyse and interpret scientific data						

2. Name of the course	General Biology						
Number of ECTS credits	5	Manner of implementation of the study programme	2	2	1	Semester 1	
Description of the course	Introduction to fundamental concepts of biology and understanding biology in the context of evolution. Special focus on marine organism and their bauplan, physiology, and behavior						
Learning outcomes of the course	- recognize cell structures and understand their function and explain the principles of inheritance in the context of evolution - describe diversity of life in the context of adaptation to the environment - explain diversity of marine animals, marine plants and algae's, as well as animal physiology and behavior in the context of adaptation to the environment - demonstrate basic skills in microscopy						

3. Name of the course	Fundamental scientific skills						
Number of ECTS credits	5	Manner of implementation of the study programme	3	0	2	Semester 2	
Description of the course	Introduction to the scientific method, data analysis, essential writing and communication skills, and the use of information technology						
Learning outcomes of the course	- communicate effectively in oral and written form (able write a scientific paper) - demonstrate a comprehension of scientific literature - formulate scientific questions and consider appropriate ways how to address them - demonstrate the effective and appropriate use of information technology - demonstrate good laboratory / field practice and knowledge of relevant safety codes - analyse, evaluate and communicate scientific information						

	individual problems After completion of the course students will be able to: - Demonstrate and identify practical examples of sustainable development in coastal areas - To adopt the principle of natural principles of coastal ecosystems - critical thinking, recognize and enacting decisions about what is sustainable and what is not - Develop a plan and design the basic steps in solving problems in the coastal environment - implement a practical project at its base principles drživog development in coastal areas						
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7. Name of the course	Marine Ecology						
Number of ECTS credits	5	Manner of implementation of the study programme	2	1	1	Semester 4	
Description of the course	Introduction to population, community, and ecosystem ecology with a mathematical approach						
Learning outcomes of the course	- demonstrate a basic knowledge on how marine systems function - explain ecological processes and systems in the sea - describe basic population and community ecology - recognize currently strong impact of human activities and its current and predicted consequences - describe the basics of how human activities can impact marine systems and organisms						

8. Name of the course	Pollution of Aquatic Systems						
Number of ECTS credits	5	Manner of implementation of the study programme	2	1	1	Semester 3	
Description of the course	To gain knowledge of pollution and protection of water and the sea						
Learning outcomes of the course	- differentiate pollutants - identify and evaluate sources of pollution - predict impact of pollution on water and marine ecosystems - suggest protection and control methods - compare national and international legal framework						

9. Name of the course	Marine Biology						
Number of ECTS credits	5	Manner of implementation of the study	2	1	1	Semester 3	

