

**ACADEMIC YEAR 2025/2026**

<b>Main information about teaching</b>	
Name of the Integrated Course	<b>MATHEMATICS AND PHYSICS</b>
Integrated teaching modules	<b>Mathematics and elements of biostatistics; Applied Physics and Hydraulics.</b>
Course of Study	Marine Production and Resources Sciences ( SPRI.Mar .) L 38
Course year	1st year
CFU	12 CFU ( 6CFU Applied Physics and Hydraulics - 6CFU Mathematics and elements of biostatistics)
SSD	FIS/06 ; MAT03
Delivery language	Italian
Disbursement period	1st semester
Compulsory attendance	No

<b>Course Teachers</b>	
Name and surname	Prof. Alessandro Cipriani, Dr. Stefano Cervellera
Email address	ciprianialessandro662@gmail.com; stefano.cervellera@uniba.it- stefanocervellera@gmail.com
Telephone	3476694131 (Alessandro Cipriani ); 099.4581224 ( Cervellera)
Site	Taranto at the former 2nd Faculty of Mathematical, Physical and Natural Sciences , Via Alcide de Gasperi, (Paolo VI District) - 74123 Taranto
Virtual headquarters	Microsoft Teams Code: ecv7fud
Reception (days, times and methods)	Monday and Tuesday 3.00-5.00 pm, or by appointment to be agreed via email.

<b>Syllabus</b>	
<b>Educational objectives</b>	The course aims to provide students with a foundational knowledge of modern physics by providing general concepts, with a particular focus on fluid dynamics and hydraulics applied to marine resources. The mathematics and biostatistics disciplines will provide students with the basic theoretical and practical elements for applying data study and analysis techniques.
<b>Prerequisites</b>	Measurement systems, mathematics and applied computer science,
Program of the teaching module of: <b>Applied Physics and Hydraulics:</b> Teacher in charge: <b>Alessandro Cipriani</b>  <b>Frontal teaching:</b> <b>CFU: 6</b>  <b>Hours: 48</b>	Introduction to mechanics and verification of preliminary notions. Physical properties of Fluids. Equilibrium of fluids at rest. Fluid statics. Fluid kinematics. Dynamics of fluids. Irrotational motions. Turbulence. Fluid currents. Free-surface currents.
Program of the teaching module of:	

<p><b>Mathematics and elements of biostatistics</b></p> <p>Teacher in charge: <b>Cervellera Stefano</b></p> <p>Frontal teaching: <b>CFU: 6</b></p> <p><b>Hours: 48</b></p>	<ul style="list-style-type: none"> <li>• Elements of statistical problems and inference</li> <li>• Elementary probability</li> <li>• Discrete and continuous random variables</li> <li>• Double and multiple random variables</li> <li>• Elements of multivariate statistical inference</li> <li>• cran laboratory for applied analysis, which is part integral and contextual to the theoretical delivery of the course, with the application of practical case studies:             <ul style="list-style-type: none"> <li>• Introduction to R, Syntax notions</li> <li>• Functions in R</li> <li>• Vectors, Matrices, Arrays, and Lists</li> <li>• The data frame</li> <li>• Data Import</li> <li>• Missing values</li> <li>• Graphic representations</li> <li>• Generalized Linear Models</li> </ul> </li> </ul>
<p><b>Biosafety regulations for the frequency of practical activities</b></p>	<p>Not foreseen</p>
<p><b>Reference texts</b></p>	<p>Recommended textbooks: Sette Alippi Bettucci PHYSICS ACTIONS 1 Zanichelli: Mossa Petrillo Hydraulics Zanichelli; lecture notes Biostatistics. Case Studies in R – Ventura Rescigno – Mybook 2017 - Statistical Programming and Analysis with R – _M. Bott – _V. Raganelli</p>
<p><b>Notes to the reference texts</b></p>	<p>Teacher's handouts</p>

<b>Organization of teaching</b>			
<b>Hours</b>			
Totals	Frontal teaching	Practice (lab, field, exercise, other)	Individual study
<b>300</b>	<b>96</b>		<b>204</b>
<b>CFU/ETCS</b>			
<b>12</b>	<b>12</b>		

<b>Teaching methods</b>	<p>The theoretical lessons will be held in the classroom, using a personal computer connected to a projector, so as to show, simultaneously with the explanation, PowerPoint slides and explanatory videos.</p>

<b>Intended learning outcomes</b>	<p>The skills acquired will be continuously assessed throughout the course. Course development, through questions and case studies related to the course. The expected learning outcomes are:</p>
<b>Knowledge and understanding</b>	<p>Knowledge and understanding of physical phenomena, mathematical principles and biostatistics</p>
<b>Applied knowledge and understanding</b>	<p>Knowledge of the usefulness of Physics for understanding events related to fluid physics, mathematics and biostatistics</p>

<b>Transversal skills</b>	Ability to apply the concepts learned with a critical spirit and the independent expansion of knowledge by the student.
<b>Assessment</b>	
Learning assessment methods	The skills acquired will be assessed towards the end of the course, through questions and practical exercises on topics related to the course. At the end of teaching, the student must be able to:
Evaluation criteria	<p>Knowledge and understanding:  or Knowing the scientific-experimental method  or Know the main application formulas for measuring natural events</p> <ul style="list-style-type: none"> <li>• Applied knowledge and understanding:</li> </ul> <p>or Know how to extract and use data in the zootechnical and veterinary fields.</p> <ul style="list-style-type: none"> <li>• Autonomy of judgment:</li> </ul> <p>or Be able to express one's opinion independently</p> <ul style="list-style-type: none"> <li>• Communication skills:</li> </ul> <p>or Good presentation skills on the proposed topics</p> <ul style="list-style-type: none"> <li>• Ability to learn:</li> </ul> <p>Correct answers to the proposed questions/topics</p>
Measurement criteria of learning and assignment of the final grade	The assessment of the learning achieved takes place through an oral exam with the aim of ascertaining the level of knowledge of the proposed topics. The grade is expressed in thirtieths. The minimum score to pass the exam is 18. Highest scoring grades are awarded to students who are able to use correct scientific terminology and have good presentation skills.
<b>Other</b>	