

BACHELOR 'S PROGRAMME  
3<sup>rd</sup> YEAR OF STUDY, 2<sup>nd</sup> SEMESTER

COURSE TITLE	<b>PHYSICS AND THE ADVANCEMENT OF KNOWLEDGE</b>
COURSE CODE	
COURSE TYPE	full attendance
COURSE LEVEL	1 <sup>st</sup> cycle (bachelor's degree)
YEAR OF STUDY, SEMESTER	3 <sup>rd</sup> year of study, 2 <sup>nd</sup> semester
NUMBER OF ECTS CREDITS	5
NUMBER OF HOURS PER WEEK	4 (2 lecture hours + 2 seminar hours)
NAME OF LECTURE HOLDER	PROF.DR. ALEXANDRU STANCU
NAME OF SEMINAR HOLDER	
PREREQUISITES	Advanced level of English
<b>A</b>	<b>GENERAL AND COURSE-SPECIFIC COMPETENCES</b>
	<p><b>General competences:</b></p> <ul style="list-style-type: none"> <li>→ Ability to understand the various theoretical and practical aspects of physics development so that it can lead interdisciplinary projects</li> <li>→ Continuous accumulation of new knowledge in the history of physics and related fields for continuing vocational training</li> <li>→ Conducting teamwork using interpersonal communication skills to achieve the objectives</li> <li>→ Efficient use of information and communication resources and assisted training, both in Romanian and in an international language</li> </ul> <p><b>Course-specific competences:</b></p> <ul style="list-style-type: none"> <li>→ Understand how some experiments led to great discoveries in physics and the role of great physicists involved</li> <li>→ Understand how evolution of society and civilization influenced the development of physics</li> <li>→ Understanding the importance of the contribution of mathematics and laboratory techniques to the development of physics</li> <li>→ Understanding the role of great thinkers in developing the important concepts of physics and their role in the philosophy of science</li> </ul>
<b>B</b>	<b>LEARNING OUTCOMES</b>
	<p>After graduating from this discipline, students will be able to have an overview of the development of the fundamental ideas of physics and in particular to:</p> <ul style="list-style-type: none"> <li>• know the context of the development of scientific knowledge of antiquity</li> <li>• argue the importance of scientific knowledge in the Middle Ages relative to the development of experimental physics methodology as a prerequisite for the emergence of scientific progress in Newtonian physics</li> <li>• Know the importance of Newton's scientific work in consecrating physics as fundamental science, and its impact on the progress of society at that time</li> <li>• argues the necessity to change the concepts of classical physics by the emergence of new concepts of energy quantification and relativity in microparticle physics</li> <li>• know the evolution of Romanian physics with institutions and schools, as well as the contribution of Romanian physicists to physics research</li> <li>• know the transdisciplinary historical aspects of physics related fields (mathematics, astronomy, chemistry, biology, technology, etc.) that have contributed to its progress as science and vice versa.</li> </ul>
<b>C</b>	<b>LECTURE CONTENT</b>
	<ul style="list-style-type: none"> <li>• Science in antiquity and early medieval times</li> <li>• Renaissance. The beginning of modern science. Nicolaus Copernicus, Galileo Galilei, Giordano Bruno, Isaac Newton. The Conflict of Science and Religion.</li> <li>• Pseudosciences (alchemy, astrology, homeopathy, etc.)</li> <li>• Industrial Revolutions</li> <li>• Science at the end of the nineteenth and early twentieth centuries</li> <li>• The beginnings of Romanian physics: Dragomir Hurmuzescu, Ștefan Procopiu, Horia Hulubei</li> <li>• Scientific method.</li> <li>• Science in the Contemporary Age. Contemporary pseudo-scientific hypotheses.</li> </ul>
<b>D</b>	<b>RECOMMENDED READING FOR LECTURES</b>
	<ol style="list-style-type: none"> <li>1. Max von Laue, Istoria fizicii, Editura Științifică, București, 1965</li> <li>2. E. Hutten, Ideile fundamentale ale fizicii, Editura Academiei, București, 1979</li> </ol>

	<ol style="list-style-type: none"> <li>3. V. Novacu, Istoria fizicii, Editura Didactică și Pedagogică, Bucuresti,1966</li> <li>4. Max Born, Fizica în concepția generației mele, Editura Științifică București,1969</li> <li>5. G. Gamow, Treizeci de ani care au zguduit fizica - Istoria teoriei cuantice, Editura Științifică, București, 1969</li> <li>6. R. Taton R.(coord.), Istoria generală a științei (4 vol.), Editura Științifică, București, 1977</li> <li>7. H. S. Williams and E. H. Williams, A history of science. New York,: Harper, 1904.</li> <li>8. THE CAMBRIDGE HISTORY OF SCIENCE  General editors David C. Lindberg and Ronald L. Numbers  volume 2: Medieval Science  Edited by David C. Lindberg and Michael H. Shank  volume 3: Early Modern Science  Edited by Katharine Park and Lorraine Daston  volume 4: Eighteenth-Century Science  Edited by Roy Porter  volume 5: The Modern Physical and Mathematical Sciences  Edited by Mary Jo Nye  volume 6: The Modern Biological and Earth Sciences  Edited by Peter Bowler and John Pickstone</li> </ol>
E	SEMINAR / LABORATORY CONTENT
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F	RECOMMENDED READING FOR SEMINARS
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G	EDUCATION STYLE
LEARNING AND TEACHING METHODS	Lecture Discussion
ASSESSMENT METHODS	Continuous, formative and summative
LANGUAGE OF INSTRUCTION	English