

COURSE OF STUDY Master Degree in Physics

ACADEMIC YEAR 2023-2024

ACADEMIC SUBJECT Beyond the Standard Model Neutrino Physics

General information	
Year of the course	<i>II</i>
Academic calendar (starting and ending date)	<i>Second semester</i>
Credits (CFU/ETCS):	3
SSD	<i>FIS/02</i>
Language	<i>English</i>
Mode of attendance	<i>Presence not compulsory</i>

Professor/ Lecturer	
Name and Surname	Antonio
E-mail	Marrone
Telephone	
Department and address	<u>Campus Universitario via Amendola 173 - 70125 Bari</u>
Virtual room	
Office Hours (and modalities: e.g., by appointment, on line, etc.)	On request

Work schedule			
Hours			
Total	Lectures	Hands-on (laboratory, workshops, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
31	16	15	62
CFU/ETCS			
3	2	1	

Learning Objectives	
Course prerequisites	

Teaching strategie	Lessons on the board
Expected learning outcomes in terms of	
Knowledge and understanding on:	Understanding the Neutrino Physics and Phenomenology
Applying knowledge and understanding on:	State-of-the-art Neutrino Physics
Soft skills	<i>Making informed judgments and choices</i> Ability to proceed autonomously in the study of neutrino physics <i>Communicating knowledge and understanding</i> Ability to express the acquired knowledge properly <i>Capacities to continue learning</i> Ability to study independently from texts and scientific literature
Syllabus	
Content knowledge	Neutrinos in the Standard Model Massive Neutrinos Dirac Neutrino Masses

	Majorana Neutrino Masses Generation of neutrino masses Effective Seesaw Mechanism Neutrino masses and Left-Right Symmetry Neutrino masses and Unification Lepton Flavor Violation Cosmological implications of Neutrino Masses
Texts and readings	Giunti and Kim, Fundamentals of Neutrino Physics and Astrophysics Fukugita and Yanagida, Physics of neutrinos and applications to astrophysics
Notes, additional materials	Some notes of the teacher
Repository	

Assessment	
Assessment methods	Oral test (100%)
Assessment criteria	Adequate comprehension and global knowledge of concepts and arguments described throughout the course.
Final exam and grading criteria	
Further information	
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