

COURSE OF STUDY *Physics (LM-17)*
ACADEMIC YEAR 2024-2025

ACADEMIC SUBJECT *Beyond the Standard Model Neutrino Physics*

General information	
Year of the course	2nd
Academic calendar (starting and ending date)	1st semester: September - December 2024
Credits (CFU/ECTS):	3
SSD	FIS/02
Language	English
Mode of attendance	Recommended, not compulsory

Professor/ Lecturer	
Name and Surname	Antonio Marrone
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Telephone	
Department and address	Campus Universitario via Amendola 173 - 70125 Bari
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
75	16	15	44
CFU/ECTS			
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	<ul style="list-style-type: none"> • <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	<i>Vote/30</i>
Further information	
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