Anno Accademico 2021/2022

PARTICLE DETECTORS	
Enrollment year	2020/2021
Academic year	2021/2022
Regulations	DM270
Academic discipline	FIS/01 (EXPERIMENTAL PHYSICS)
Department	DEPARTMENT OF PHYSICS
Course	
Curriculum	Fisica nucleare e subnucleare
Year of study	2°
Period	2nd semester (01/03/2022 - 15/06/2022)
ECTS	6
Lesson hours	48 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	BRAGHIERI ALESSANDRO (titolare) - 3 ECTS GAUDIO GABRIELLA - 3 ECTS
Prerequisites	Basic concepts of electromagnetism, quantum mechanics and statistics
Learning outcomes	Understanding of the processes of interaction of radiation with matter and the physical principles of radiation detection. Experiences with detectors of common use in particle physics and others fields.
Course contents	Quick refresh (AB) key concept of relativity radioactivity and radioactive decay particle classification, quark model and standard model Particle detectors characteristics (GG) passage of radiation through matter with Geant simulation (AB) Gas detectors (AB) Scintillating detectors (GG) Calorimetry (GG)

Semiconductor detectors (AB)
Particle identification techniques(GG)
Pulse height analysis and electronics (AB)
Triggering techniques (GG)
Examples of detectors for nuclear and subnuclear physics, for astrophysics, for medical, industrial and technological applications.

Teaching methods	Front lectures using slides to show diagrams and experimental results. Geant Simulations. Detector measurements and exercises.
Reccomended or required readings	C. Grupen and B. Shwartz, Particle Detectors. Cambridge W.R. Leo, Techniques for Nuclear and Particle Physics Experiments. Springer- Verlag Recent review papers
Assessment methods	Oral examination. The focus will be mainly on the physics of radiation detection and on the ability of the student to identify the more suitable instrumentation for measuring a certain physical process
Further information	
Sustainable development goals - Agenda 2030	$lbl_legenda_sviluppo_sostenibile