

Basic/Essential Course Information	
Course title	NUCLEAR MEASUREMENT TECHNIQUES
Degree Course title	PHYSICS
ECTS	4
Compulsory attendance	No
Course teaching language	ITALIAN

Teacher	Enrichetta Maria FIORE	enrichettamaria.fiore@uniba.it
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ECTS Details	Disciplinary area/broad field	SSD	ECTS
	Free choice	FIS/01	4

Time management and teaching activity type	Period	Year	Lesson type
	1° semester	2°	Lessons (32h)

Time management	Total hours	In-class/in-lab study hours	Out-of-class study hours
	100	32	68

Course calendar	Starting date	Ending date
	24.09.2018	21.12.2018

Syllabus	
Prerequisites	Theoretical knowledge of radiation sources, radiation-matter interaction and methods of detection
Expected learning outcomes (according to Dublin Descriptors)	<p>Knowledge and understanding of Mastery of general properties and methods of operating radiation detectors and fast electronics for the acquisition of detectors electrical signals. Knowledges acquisition about scintillation detectors.</p> <p>Applying knowledge and understanding Ability to identify experimental procedures suitable for solving problems of academic and applied research.</p> <p>Making judgements Ability to evaluate the most suitable instrumentation for an experiment.</p> <p>Transferable communication skills Acquisition communication skills in advanced physics areas.</p> <p>Lifelong learning skills Acquisition of skills to access specialized literature in the experimental field.</p>

Course contents summary	Properties and ways of operating the detectors. Amplitude analysis and pulse timing systems. Digital pulse treatment. Scintillation detectors.
Detailed syllabus	Recalls on radiation sources and radiation interactions with matter. General properties of the detectors. Modes of operation of the detectors. Impulse nuclear electronics signals. Common electronic components. of the pulse amplitude analysis systems. Pulse timing systems. Measurements of temporal properties. Digital processing of the pulses. analog-to- digital converters. Multichannel pulse analysis. Scintillation detectors: general characteristics and applications.
Books	G. F. Knoll – Radiation Detection and Measurements – John Wiley & Sons, Inc. W. R. Leo – Techniques for Nuclear and Particle Physics Experiments – Springer & Verlag G. Gilmore – Practical Gamma – ray Spectrometry - John Wiley & Sons, Inc.
Notes	Some chapters
Teaching methods	Lectures with video projector.
Assessment % of final mark	Oral test (100%),
Evaluation criteria	<p>To know the general properties and the operating modes of the detectors and of the associated fast electronics.</p> <p>Knowing how to identify experimental procedures to solve problems of academic and applied research.</p> <p>Know how to evaluate the most suitable instrumentation for an experiment.</p> <p>Knowing how to communicate one's knowledge with appropriate scientific language.</p> <p>Ability to independently access specialized literature in the experimental field.</p>
Other	