Course Unit Descriptor

Study Programme: Master Academic Studies in Physics

Course Unit Title: Nuclear Instrumentation

Course Unit Code: M18NI

Name of Lecturer(s): Full Professor Dusan Mrdja

Type and Level of Studies: Master Academic Degree

Course Status (compulsory/elective): Elective

Semester (winter/summer): Summer

Language of instruction: English

Mode of course unit delivery (face-to-face/distance learning): Face-to-face

Number of ECTS Allocated: 8

Prerequisites: Nuclear Physics

Course Aims:

Introducing students to the concepts of nuclear instrumentation

Learning Outcomes:

Gaining knowledge about nuclear instrumentation, which is applied in the research field of nuclear physics.

Syllabus:

Theory

The pulse signals in nuclear electronics. (Terminology. Analog and digital signals. Fast and slow signals).

NIM Standard (Modules. NIM bins for power supply.)

Signal transmission (Coaxial cables. Adjusting the impedance. The losses in cables and pulse distortion.)

Electronics for processing of pulse signals (Preamplifiers. Amplifiers. Discriminators. Single-channel analyzers. Multi-channel analyzers. The time-amplitude converter. Scalers. Coincident units.)

Computer-controlled electronics: CAMAC.

Practice

Demonstration of work and characteristics of certain modules frequently used in nuclear electronics.

Required Reading:

1. W.R.Leo, Techniques for Nuclear and Particle Physics Experiments: A How-to Approach, Springer Verlag, 1994.
2. G.F. Knoll, Radiation Detection Measurements, John Willey & Sons, New York, 1979.

Weekly Contact Hours:	**Lectures:** 3	**Practical work:** 2

Teaching Methods:

Lectures, practical work and seminars.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	**Final exam**	points
Active class participation	5	written exam	
Practical work	5	oral exam	70
Preliminary exam(s)		…….	

Seminar(s)	20		
The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.			