



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Radiation Matter Interaction

2223-1-F5302Q007

Aims

The aim is to give a general overview about the interaction of ionizing radiation with matter, pointing out the dependence on energy and type of target material. The course provides knowledge about the energy transfer from ionizing radiation, both charged and uncharged particles (photons and neutrons), to matter and it introduces some applications based on the mechanisms between ionizing radiation and materials.

Contents

Fundamental nuclear physics. Radioactivity. Sources of ionizing radiation. Energy transfer from radiation to materials. Application of experimental techniques based on the interaction radiation-matter.

Detailed program

Important topics are: Interaction cross sections (classical), mechanisms for interaction of photons, neutrons and charged particles, fundamental entities in dosimetry, defects induced by radiation. Experimental techniques for the study of the effects of the interaction radiation-matter on the physical properties of the materials: nuclear techniques, as Accelerator Mass Spectrometry (AMS), luminescence techniques and X-ray Fluorescence (XRF), with particular focus on archaeometric applications, like dating and ancient materials identification and measurements.

Prerequisites

Basic knowledge of physics of matter

Teaching form

Classroom lectures and experimental activities. Visits to research laboratories.

Textbook and teaching resource

Slides and "ad hoc" textbook provided by the professor

Semester

Second semester (March-June)

Assessment method

The exam is in the form of an oral interview. It consists of:

- a discussion about the topics treated during the lessons ;
- a discussion on the experimental activity carried out in the laboratory, also on the basis of the written report.

Students are requested to send the report to the professor by e-mail in word or pdf format at least one week before the exam.

Office hours

8 - 18

Appointments between professor and students can be agreed by e-mail.

Sustainable Development Goals

AFFORDABLE AND CLEAN ENERGY
