



## SUBJECT DATASHEET

<b>Semester:</b>	2010/11/2
<b>Subject:</b>	Radiotrace Methods
<b>Code:</b>	VEMKRKM412R
<b>Responsible department:</b>	Institute of Radiochemistry and Radioecology
<b>Responsible department code:</b>	MKRK
<b>Responsible lecturer:</b>	dr. Kálmán Varga

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### Educational objectives:

Acquirement of the basic aspects of the radioactive tracer techniques.

### Detailed content of the subject:

Fundamentals in radiochemistry. Interactions of  $\alpha$ -,  $\beta$ -,  $\gamma$ - és neutron radiations with matter. Dosimetry. Nuclear detectors. Electronic devices. Evaluation of nuclear measuring data. Fundamentals in radioactive labelling methods Fundamental issues of the elaboration procedure. Classification of the radiotracer techniques: in-situ and ex-situ methods. Potentialities of the application of the radiotracer methods Research and development. Nuclear medicine. Radioactive contamination-decontamination and corrosion-corrosion prevention at different parts of the nuclear fuel cycle. Investigation methods based on nuclear radiations Mössbauer-spectroscopy, positron emission-tomography (PET). Neutron activation analysis (NAA). Auger-electron spectroscopy (AES), X-ray photoelectron spectroscopy (XPS).

### Requirements:

In the course of an oral examination two overall questions on the issues of the lectures are provided to each student. A short period of time (maximum 30 minutes) is supplied to the students to prepare some drafts of their answers. The exam is qualified in the following ways: - If draft and the answers provided by the student are clear, correct and explains every important relationship on the subject, the record is marked as excellent one (5). - If the student is able to make an overall analysis on the issue solely by the directions of the teacher, he (she) is assessed with a good record (4). - If the student is not able to give clear description on the main relationships of the subject but he (she) can define the fundamental conceptions, his grade is a fair (medium) (3). - If the student can define the fundamental conceptions of the issue by the directions of the teacher, he gets a pass (2). - Without having studied the fundamental conceptions the student is qualified with an unsatisfactory (fail) record (1).

### Required and suggested references:

Nagy L. Gy.: Radiokémia és izotóptechnika. Tankönyvkiadó, 1998. A. Vértes, I. Kiss: Nuclear Chemistry. Akadémiai és Elsevier Kiadó, 1987. G. Choppin, J. Rydberg, J.O. Liljenzin: Radiochemistry and Nuclear Chemistry. Butterworth, Oxford, 1995. Környei J.: A nukleáris medicina fizikai, kémiai alapjai. Kossuth Egyetemi Kiadó, Debrecen, 1997.