



SUBJECT DATASHEET

Semester:	2010/11/2
Subject:	Nuclear emergency management, radioactive waste management
Code:	VEMKRKR212N
Responsible department:	Institute of Radiochemistry and Radioecology
Responsible department code:	MKRK
Responsible lecturer:	Tibor Kovács

Educational objectives:

Getting knowledge about the prevention of nuclear accidents and expert handling of nuclear wastes.

Detailed content of the subject:

Nuclear, radiation dosimetric and radiation protection fundamental conceptions and the sources of public exposures, radiation routes. Dose limitations, intervention and action levels in the international (European) and national regulation. Cost-benefit analysis, optimizing of dose avoiding in case of intervention, preparing of decision. Intervention possibilities for reduction of public exposition, prognosis of public exposition. Experiences of environmental contaminating nuclear accidents (Three Mile Island, Windscale, Kistim, Chernobyl). Environmental radiation monitoring systems, national and international networks. Nuclear accident preventing system of the nuclear power station in Paks, National Nuclear Accident Preventing System. Classification of radioactive wastes. Radioactive wastes from the field of radioisotope applications. Environmental contaminations of the uranium mining. Gas emission of the nuclear power stations, environmental control. Low activity wastes in the atomic reactors. Medium activity wastes of the atomic reactors. High activity wastes from the atomic reactors. Handling of the solid and liquid wastes (transmutation, radiochemical separation). Liquidation of nuclear power stations. Rules and regulation of handling and storing the radioactive wastes. Planning of radioactive waste deposits, environmental suitability examinations. The temporary storage and final placing of radioactive wastes. Environmental recultivation of an uranium mine. Recultivation of radiation contaminated areas. Radioactive wastes of non-nuclear technologies (clinkers from coal power plants).

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).



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Required and suggested references:

Kanyár B., Béres Cs., Somlai J, Szabó S.A.: Radioökológia és környezeti sugárvédelem, Veszprémi Egyetemi Kiadó, Veszprém, 2000. W.D. Ehmann, D.E. Wance: Radiochemistry and Nuclear Methods of Analysis, J.W. & Sons, New York 1991. G. Choppin, J. Rydberg, J.O. Liljenzin: Radiochemistry and nuclear chemistry (Butterworth, Oxford, 1995). IAEA Publication: Criteria for clean up of Contaminated Areas (to be issued by IAEA, Vienna) IAEA TR. No. 362. Decommissioning of Facilities for Mining and Milling of Radioactive Ores and Closeout of Residues IAEA, Vienna, 1994. K. Pflugrad, R. Bisci, B. Huber, E. Skupinski: Decommissioning of Nuclear Installations, Elsevier Sciences, London, 1990.