



**Karolinska  
Institutet**

Course syllabus for

## **Radiographic methodology 3, 7.5 credits**

Radiografisk metodik 3, 7.5 hp

This course syllabus is valid from spring 2008.

Please note that the course syllabus is available in the following versions:

Spring2008 , Autumn2009 , Autumn2011 , Spring2012 , Autumn2013 , Spring2017 , Spring2019 , Spring2023 , Spring2024 , Spring2025

Course code	1RS015
Course name	Radiographic methodology 3
Credits	7.5 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Radiography
Level	G2 - First cycle 2
Grading scale	Pass with distinction, Pass, Fail
Department	Department of Clinical Science, Intervention and Technology
Decided by	Programnämnden för Röntgensjuksköterskeprogrammet
Decision date	2007-12-11
Course syllabus valid from	Spring 2008

## **Specific entry requirements**

Standardised admission requirements F.1.1.

## **Objectives**

On completion of the course, the student should be able to : Account for what actions and equipment to be used in order for patient and staff radiation protection to function satisfactorily, and in accordance with SSI's regulations and the ALARA-principle, at a department of radiology and a nuclear medical clinic. Reason about considerations that may arise such as the examination of women of fertile age, child examinations, supplementary images etc Account for various types of personal dosimeters and describe the basic principles of gas-filled detectors, scintillation detectors and semiconductor detectors. Describe the interaction of radiation with tissue/DNA based on concepts such as direct interaction/indirect interaction and the structural changes in DNA that may occur and the mechanisms of the cell for repairing the injury. Explain in what way radiation biological effects (grade of injury) are controlled by factors due to the circumstances of the exposure such as e. g. LET, dose rate, presence of oxygen, and inherent factors of the irradiated cells such as mitotic rate, grade of differentiation and stage in the cell cycle. Explain and discuss how the classification into stochastic and deterministic effects is related to radiation biology. Explain the concepts of absorbed dose, effective dose and equivalent dose based on the different effects of radiation types on biological tissue, and the radiation sensitivity of

different cells. Account for radiation injury effects on various organ systems, and describe various types of acute radiation symptoms.

## Content

The course gives advanced knowledge of the biological injuries and risks that can arise in using ionising radiation. Knowledge is also provided about different ways of detecting radiation and the radiation doses that may occur in using medical equipment for ionising radiation. In order to understand adequate radiation protection measures in their profession function, advanced knowledge about the laws and regulations that control the subject area is provided both to patients and staff. The part also provides knowledge about radiation and its use in society and environment, and risks associated with this.

## Teaching methods

The course is mainly based on lectures and seminars.

## Examination

For a Pass grade in the course, approved participation in seminars and an approved individual written examination assignment are required. In consultation with the examiner of the course, the student may get a complementary assignment in case of absence from a compulsory part. The student is entitled to a total of six test occasions to get passed. The course is given on three occasions. One within the course, one during the following re-examination. The third opportunity is provided before the beginning of the next semester, or in close connection to that. In some cases, it is required that the student submits an exemption application before he/she has the results of his/her latest completed examination. Three more opportunities are provided according to the same set-up when the course is given next time.

## Transitional provisions

The student may be examined under a previous syllabus within a year after the date when a close-down or major changes of the course was decided.

## Other directives

Course evaluation will be carried out in accordance with the guidelines established by the Board of Education at Karolinska Institutet.

## Literature and other teaching aids

*Isaksson, Mats*

**Grundläggande strålningsfysik**

*Lund, Annika*

Lund : Studentlitteratur, 2002 - 310 s.

ISBN:91-44-01528-3 LIBRIS-ID:8427844

[Library search](#)

**The essential physics of medical imaging**

*Bushberg, Jerrold T.*

2. ed. : Philadelphia, Pa. : Lippincott Williams & Wilkins, cop. 2002 - xvi, 933 s.

ISBN:0-683-30118-7 ; £75.00 LIBRIS-ID:8294132

[Library search](#)

## **Strålskydd**

*Johansson, Karl-Johan; Jansson, Leif-Tage; Rydén, Bengt Erik*

3., rev. utg. : Stockholm : Natur och kultur i samarbete med Uppsala univ., 2000 - 215, [1] s.

ISBN:91-27-08232-6 LIBRIS-ID:8348481

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