Course syllabus for

The digital image, 7.5 credits

Den digitala bilden, 7.5 hp

This course has been cancelled, for further information see Transitional provisions in the last version of the syllabus.

Please note that the course syllabus is available in the following versions:
Spring2010 , Spring2012

Course code	1RS039
Course name	The digital image
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, Fail
Department	Department of Clinical Science, Intervention and Technology
Decided by	Programnämnden för biomedicinska analytikerprogrammet och röntgensjuksköterskeprogrammet
Decision date	2010-01-13
Revised by	Education committee CLINTEC
Last revision	2017-04-27
Course syllabus valid from	Spring 2012

Specific entry requirements

To be qualified to a higher semester, it is required that the student has taken at least 15 ECT credits from last semester, and all credits from previous semesters.

Objectives

On completion of the course, the student should :

• be able to account for the structure of the digital image based on concepts as matrix pixel size, histograms, the LUT - bends and bite depths.

• be able to describe and measure the quality of an image by means of concepts as contrast, noise, sharpness, frequency and detailed resolution

• independently be able to carry out image processing of digital images by means of window level and edge-strengthening, equalising, noise cancelling and contrast-strengthening filter

• be able to account for how the most common image processing tools affect the image quality

• be able to discuss the possibilities, the limitations and the risks with image processing of clinical images

Content

The course deals with digital images structure with use of concept as pixels, matrix, pixel values, LUT-kurva, bite depths and ”window level”.

The course also deals with different ways to represent and analyse the characteristics of a digital image based on concepts such as contrast noise, sharpness, perception and histogram, and how these change with exposure parameters in X-ray.

The course also gives basic knowledge of the most common image processing methods applied in X-ray examinations and what options and limitations are associated with this.

The course gives, in the form of a group assignment, an overview of various types of image processing for a number of different manufacturers of X-ray examinations.

Teaching methods

The course consists mainly of computer exercises that are examined by the student compiling an individual portfolio.

The course also contains a few lectures. These are not compulsory but the information from these can also be acquired in the reading list.

A group assignment is presented in the form of an oral group presentation. Each group summarises their group assignment in a brief assignment.

The student's current knowledge are controlled continuously during the course in the form of three paragraphs tests that are carried out weekly on the course web page (these tests is not a part of the examination).

Practical assignments laboratory session's hand showings and portfolio is to obtain on the course web page.

Examination

A passing grade requires a complete portfolio that has been approved by the course directors. A pass grade also requires a passed group assignment. This includes attendance in the compulsory group presentation and an approved group assignment. Written complementary assignment in case of missed presentation or when the course is studied at distance.

Transitional provisions

The course has been cancelled.

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

The Esential Physics of Medical Imaging : Second Edition
Buchberg, J.T; Seibert, J.A; Leidholdt, E.M; Boone, J.M

2:a : Philadelpia : Lippincott Williams Wilkins, 2002 - 933
ISBN:0-683-30118-7
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