



**Karolinska
Institutet**

Course syllabus for

Ultrasound diagnostics 1 - Cardiac, 7.5 credits

Ultraljudsdiagnostik 1 - Hjärta, 7.5 hp

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

Course code	1BA072
Course name	Ultrasound diagnostics 1 - Cardiac
Credits	7.5 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Biomedical Laboratory Science
Level	G1 - First cycle 1
Grading scale	Pass with distinction, Pass, Fail
Department	Department of Laboratory Medicine
Decided by	Programnämnd 6
Decision date	2012-11-06
Revised by	Education committee LABMED
Last revision	2017-09-28
Course syllabus valid from	Spring 2013

Specific entry requirements

General entry requirements for higher education. Specific entry requirements: According to the programme syllabus of the study programme for biomedical analysts, Specialization Physiology or the equivalent.

Objectives

On completion of the course, the student should be able to:

- Account for the physical principles that underlie the ultrasound technique including the Doppler Technique
- Describe schematically how the analog signal is converted digitally, as well as the principles of digital image processing and account for various forms of storing and processing of digital images
- Identify the different anatomical structures in the ultrasound images of the heart and account for where and how these images are recorded
- Account for different heart-diseases, their aetiology, symptoms, pathophysiology, treatment and how they are diagnosed, with ultrasound and Doppler Technique
- Describe the projections and techniques to be used in different issues in cardiac diagnosis and the formulae, normal values and calculations to be applied.

- Under supervision implement a complete ultrasound examination with dimension, function and flow measurements in an individual without any heart disease
- Account for calibrations, sources of error and maintenance works that may be needed for an ultrasound machine
- Receive and prepare patients for ultrasound examination of the heart and use current routines for this,
- Summarise the objectives in the Higher Education Ordinance of the Bachelor of Science in Biomedical Laboratory Science concerning assessment skills and approaches, and in clinical practice also be able to apply these

Content

The course comprises lectures and assignments about physical principles of various forms of ultrasound such as B-mode, M-mode, two-dimensional image reproduction and flow and motion measurement with continuous Doppler, plodded Doppler, colour Doppler and energy Doppler.

Based on echocardiographic and Doppler images, the underlying physiology, anatomy and pathophysiology of healthy and sick hearts are discussed. Principles for the construction of equipment used in echocardiography including sensor for transthoracic and transesophageal heart examination as well as safety aspects and calibration of equipment is discussed. An overview of the use of the ultrasound technique for diagnosis of heart-diseases in children and adults. The structure, processing, transfer and storing of the digital image are discussed and practiced. An important part of the teaching strategy is the use of practical group exercises and training in appropriate techniques with an emphasis on their use in different clinical physiology investigations in clinical practice.

Teaching methods

The course is given in the form of lectures, demonstrations, individual and joint laboratory sessions, and practical learning elements.

During part of the course a clinical rotation is performed on various Physiology clinics. During this practise the student is filling out a loggbook with information on examined patients, measurement of exams and description of exam routines in conjunction with the supervisor.

Examination

Examination is given in the form of practical examinations and a written examination. Demonstrations, laboratory sessions and practical parts are compulsory. In case of absence, an agreement concerning supplementation is made between the student and the responsible teacher . A re-examination session is provided in connection with the course, and during a re-examination week in August. A student without approved results after 4 completed examinations is offered to retake the course (or the parts without approved results). However, at most 6 examination sessions.

In case of a failed laboratory session or clinical practice, the student has the opportunity to redo these on one occasion.

Transitional provisions

Examination according to this syllabus will be provided during a year after a decision on close-down of the course or revision of the syllabus.

The course has been cancelled and was offered for the last time in the spring semester of 2013.

Examination will be provided until the spring of 2018 for students who have not completed the course.

Other directives

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

Literature and other teaching aids

Jonson, Björn; Wollmer, Per; Brauer, Kerstin

Klinisk fysiologi : med nuklearmedicin och klinisk neurofysiologi

3., [omarb.] uppl. : Stockholm : Liber, 2011 - 397 s.

ISBN:91-47-10363-9 LIBRIS-ID:12239801

[Library search](#)

Olsson, Arne

Ekokardiografi

3., [omarb. och kompletterade] uppl. : Stockholm : Ultraview, 2010 - viii, 103 s.

ISBN:978-91-633-7284-1 (spiralh.) LIBRIS-ID:11950918

[Library search](#)

Holmer, Nils-Gunnar

Diagnostiskt ultraljud : grunderna

2. uppl. : Lund : Teknikinformation, 1992 - viii, 400 s.

ISBN:91-88156-02-8 LIBRIS-ID:7769368

[Library search](#)

Leeson, Paul; Mitchell, Andrew R. J.; Becher, Harald

Echocardiography

Oxford : Oxford University Press, 2012 - xiv, 688p.

ISBN:978-0-19-959179-4 (flexicover: alk.paper) LIBRIS-ID:13562015

[Library search](#)

Ejlertsson, G

Grundläggande statistik med tillämpningar inom sjukvård

Lund : Studentlitteratur, 2003