Course Specifications

Radiologic Techniques (E025490)

Valid in the academic year 2015-2016

Bacher, Klaus  
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Lecturers in academic year 2015-2016

Course offerings and teaching methods in academic year 2015-2016

A (semester 1)  
practicum  12.5 h  
lecture  17.5 h

Offered in the following programmes in 2015-2016

<table>
<thead>
<tr>
<th>Programme</th>
<th>Credits</th>
<th>Offering</th>
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<tbody>
<tr>
<td>Master of Science in Biomedical Engineering</td>
<td>3</td>
<td>A</td>
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<tr>
<td>International Master of Science in Biomedical Engineering</td>
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<tr>
<td>Master of Science in Biomedical Engineering</td>
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Teaching languages

English

Keywords

image quality, nuclear medicine, radiology, quality assurance

Position of the course

The student will get knowledge and insight into the physical principles in medical imaging. Special attention is given to quality assurance and performance measurements of the various imaging techniques and dose calibrators. Thereby this course is an addition to the courses of biomedical signals and images and medical physics where the instrumentation and the effects of ionizing radiation are respectively discussed.

The purpose is to prepare the student for a responsible function in biomedical imaging. In this way the student can make well-considered judgements about the state of biomedical imaging equipment. The student can also critically evaluate new instrumentation trends.

Contents

- Radiation detection
- Radiation spectroscopy
- Image quality: aspects of image quality
- Nuclear medicine:
  - Introductio
  - Use and QC of dose calibrators
  - Introduction
- PET: principles and image quality
- SPECT: principles and image quality
- X-ray imaging:
  - Introduction
  - Conventional and digital radiography
  - Conventional and digital mammography
- Fluoroscopy
- CT
- Medical grade display systems
- Imaging techniques: integration

Initial competences

Basic medical physics, basic signal- and image processing

Credits  3.0  
Study time  90 h  
Contact hrs  22.5 h

Contact hrs  22.5 h

Course size

(nominal values; actual values may depend on programme)

(Approved)
Final competences
1. To understand the job content and responsibilities of a medical physicist in a nuclear medicine or radiology department.
2. Being able to make well-considered judgements about the state of biomedical imaging equipment.
3. Being able to critically evaluate new instrumentation trends in medical imaging.

Conditions for credit contract
Access to this course unit via a credit contract is determined after successful competences assessment.

Conditions for exam contract
This course unit cannot be taken via an exam contract.

Teaching methods
Lecture, practicum

Extra information on the teaching methods
Classroom lectures; Lab sessions

Learning materials and price
Powerpoint slides and course

References

Course content-related study coaching
Individual meetings with the lecturers are possible on an ad hoc basis.

Evaluation methods
End-of-term evaluation and continuous assessment.

Examination methods in case of periodic evaluation during the first examination period
Oral examination.

Examination methods in case of periodic evaluation during the second examination period
Oral examination.

Examination methods in case of permanent evaluation
Report.

Possibilities of retake in case of permanent evaluation
Examination during the second examination period is not possible.

Extra information on the examination methods
During semester: report practical session practicum (1x).

Calculation of the examination mark
Evaluation during examination period and report on practical session.