



QUALITY ASSURANCE THROUGH OPTIMIZATION

Radiography Program UCL Odense, Denmark

Purpose

The purpose of this module is to increase student mobility in the field of radiography education, and to comply with requirements of accreditation. The module will appeal to students who want to learn more about quality assurance through optimization, and the carrying out of experimental method as a tool to scientifically verify pros and cons.

Details of the number of ECTS

The ECTS will consist of 6 theoretical, 12 clinical and 2 for language and culture with 20 ECTS in all.

Information on the content of the theoretical study

The content of the theoretical study is quality assurance and development based on science theory and research methodology. These subjects will ensure students to acquire knowledge and qualifications to perform professional radiographic developing work.

Whether home students will be studying alongside the incoming students.

Home students and incoming students will be studying alongside during lessons in "QA in medical imaging" and in clinical placements. Home students will have the opportunity to join the incoming student's lessons, depending on the number of students in all.

Table of content

Teaching consist of lectures, dialogue based teaching, group work, feed back, "hands on" on modality work in learning laboratory and individual studies.

Week	Content
1	Introduction to ERG module, Campus, PACS and itslearning Culture in the radiology department and classroom
1-4	Communication
2	Ultrasound
3	CT
4	Introduction to assignment criteria Culture
5-8	Clinical placement
9-10	QA in medical imaging
11	DR

	Introduction to experiment set up
12	MRI
13	VGA Work on experimental set up

Further description

The first week will be an introduction to the module, planned activities, and some of the different study tools and techniques used during the period.

There will be lessons in the Danish culture and educational system, and the students will prepare and perform, a presentation of their own culture and education. The students will have culture and communication lessons where a Danish “parleur” will be developed and they will be introduced to the language task.

Introduction to the modalities and their functions, in order to know, how to assure quality before being able to optimize radiographic procedures and images and in relation to common pathological findings. There will be 3 introduction lessons in each modality (UL/CT/UL/MRI). Students will perform hands on tasks in our learning laboratory. Introduction to the criteria of the final assignment will be given after clinical placement.

CT	Phantoms: Cat fan, Quality assurance phantoms for CT scanner Brush up on CT technique Image quality Radiation dose in CT New development in CT regard to optimize image quality and radiation dose
Ultrasound	Gain TGC curve Focus Dept Mhz -Transducer Phantoms: ultrasound quality assurance phantom multipurpose phantom Abdominal phantom for optimizing the image, and how to evaluate the anatomy.
MRI	High-contrast spatial resolution Spatial linearity Image uniformity Signal-to-noise ratio

	Resonance frequency Slice position/separation Image artifacts
DR	Phantoms: DIG RAD Dynamic Range Contrast Resolution Homogeneity Local resolution Position and size of the effective radiation field (optional) Spatial resolution

Clinical placement

Clinical placement at Odense university Hospital and Svendborg hospital will have to calculate transport fee for all 4 weeks.

Each clinical department will aim to give the students the possibility to evolve from observer to independent practitioner. In association with a clinical supervisor, the contents of the clinical placements will be organized and planned individually with each student, so the student will gain qualifications described within the module: Quality assurance through optimization.

- Examinations within the fields of MRI, CT, UL and conventional x-ray.
- Examination procedures and the technique behind digital imaging.
- independently be able to perform uncomplicated examinations on all modalities, and in the technical work
- Optimizing radiation doses and image quality in examination procedures
- Take part in the statutory monthly quality assurance.

QA in medical imaging

Students study alongside Danish 3rd year students in the "QA in medical imaging" module.

- Positivist research principles and criteria
- Characteristics of quantitative experimental studies
- Problem identification, project protocols and research management
- Result analysis including statistics
- Presentation of a previously performed research experiment

Written assignment

The purpose of the assignment is to evaluate the students ability to discuss and reflect upon the preformed task, and to evaluate pros and cons of the used method, design, results and execution of the experiment, and to suggest alternative possibilities.

The students initiate their written group assignment where they will identify and describe a problem. They will be able to immerse themselves in an experimental method in order to develop skills in optimization of examination protocols, organizing and developing science projects in order to be able to participate actively in research and development work in radiography.

Learning objectives

- The student gets opportunity to work with the phantoms and measurement equipment available in the Radiography Education imaging laboratories.
- The student gets opportunity to practice a scientific design for their bachelor project.
- The student gets opportunity to develop an in-depth theoretical and practical knowledge on how to organize an experimental study.
- The student gets knowledge and understanding of how to safely and systematically perform an - experiment.
- The student gets insight into how results from an experimental study can be processed and analyzed.

Criteria for the written assignment

The written assignment is a group assignment consisting of:

- Issue (the identified Problem)
- Present a research question
- Establishment of the experimental set up and the written description of it and brief discussion of the method and design.
- Description of the execution of the experiment with results
- Statistical analysis
- Conclusion

References: Harward or Vancouver.

Extent: maximum 15.400 characters Times New Roman 12 (7 pages) including the actual text, excluding front page, index, and reference list and, if appropriate, list of appendixes.

The student will prepare their paper for the final exam (to be performed in week 13), and experimental set up (to be presented in week 12). Dissemination of the project in week 13.

Examination

Individual oral exam that will take place Friday in week 13.

The student has 10 minutes dissemination and is questioned for 10 minutes Evaluated according to the 7 point grading scale

7 point grading scale	12	10	7	4	02	00	-3
ECTS	A	B	C	D	E	Fx	F

Expected outcome of acquired knowledge and qualifications

- That the student acquires knowledge and understanding of the significance of development and research based work in relation to the radiographer’s profession.
- That the student acquires qualifications to perform professional radiographic developing work, where experiences from clinical radiography, knowledge on central tendencies within the profession, and knowledge on methods of documentation and development of the subject, are included.
- That the student acquires knowledge and understanding of the significance of medicinal technology assessment as a basis of evaluating, and knowing the consequences of applying medicinal technology.
- That the student acquires knowledge and understanding of communication skills and pedagogic principles, as a prerequisite to educating and guiding patients, students and co- operators,
- That the student is aware of his/hers radiographic competence and can relate to and argue for his/hers own values and opinions.