

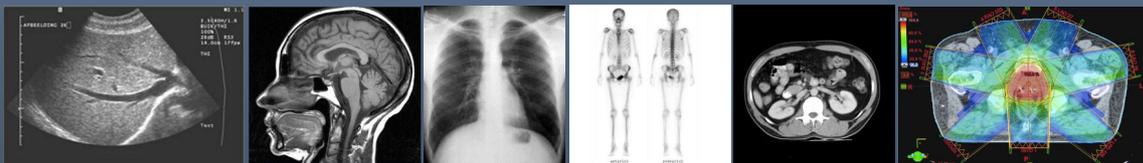


NATIONAL TRANSCRIPT

Dutch

Radiographer Bachelor programme

Medical Imaging and Radiotherapy



This document is an additional supplement attached to the Bachelor certificate Medical Imaging and Radiotherapy.

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Foreword National transcript

It is with great pride that we present the National Transcript for Medical Imaging and Radiotherapy Bachelor programme in the Netherlands

This is a joint product of the three Universities of Applied Sciences offering the Bachelor's programme Medical Imaging and Radiotherapy : Fontys University of Applied Sciences Eindhoven, Inholland University of Applied sciences Haarlem and Hanze University of Applied Sciences Groningen.

The board meeting (SRO) of the three universities decided in September 2013 to start up a project to rewrite the National transcript.

The general aim of this National Transcript is to provide independent information to improve international transparency and fair academic and professional recognition of qualifications. It is designed to provide a description of the nature, level, context, content and status of the Bachelor of science in Medical Imaging and Radiotherapy. The graduate, named on the certificate "Getuigschrift Hoger Beroepsonderwijs Bachelor Medisch Beeldvormende en Radiotherapeutische Technieken" successfully completed the programme.

June 2015

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Introduction

The National Transcript (NT) describes the subjects covered by Bachelor programme Medical Imaging Radiotherapy and study load according to ECTS. The subjects (corresponding with knowledge, skills and attitude) indicate a Dutch graduate's minimum qualification. This specifically relates to knowledge, skills and attitude acquired through a higher professional qualification in which students are trained to practice as Radiographer*. This requires not only knowledge, skills and attitude, but also the application of knowledge and insight, sense of judgment, communication skills and learning capacity at the level of higher professional Bachelor degree.

The National Transcript is intended to create greater clarity on Medical Imaging and Radiotherapy Bachelor programmes in the Netherlands. The base of the programme amongst the three universities is the same, but the scope can vary for each curriculum. The scope is therefore expressed in a minimum and maximum number of credits, according to the European Credit Transfer System. The Bachelor programme Medical Imaging and Radiotherapy in the Netherlands is an integrated programme and combines knowledge, skills and attitude for as well as medical imaging (radiodiagnostics, magnetic resonance imaging, nuclear medicine, ultrasound,) and radiotherapy.

Students completing successfully the Bachelor programme Medical Imaging and Radiotherapy are radiographers qualified for working in all fields of medical imaging and radiotherapy.

Recognition of qualification

For the mutual recognition of professional qualifications the European Commission designed Directive 2005/36/EC¹ for those who are qualified to practice a profession in one Member State and wish to have their qualifications recognized in another, in order to practice the same profession there. (more information on diploma recognition see the website of the European Commission:

http://ec.europa.eu/internal_market/qualifications/regprof/index.cfm?fuseaction=home.)

* The EFRS (European Federation of Radiographer Societies) recommends European official bodies and authorities to use the title "Radiographer" in all their documents and correspondence at the European level. The title of radiographer represents the specific group in healthcare, working in medical imaging and radiotherapy.

Relationship with European Qualification Framework

The European Qualification Framework (EQF)² is a system of uniform credential evaluation. It aims to facilitate the free movement in the EU. The Dutch graduate Bachelor radiographer is awarded at level 6 in EQF.

Part A Bachelor Medical Imaging and Radiotherapy

Higher professional education in the Netherlands is provided by universities of applied sciences and leads to a Bachelor as described in the Bologna process. The duration of the Bachelor is 4 years consisting 240 ECTS.

The variation in provision of education, content and duration of the curriculum within the EU fluctuates. However, in November 2013, the European Federation for Radiographer Societies (EFRS) has established an EQF level 6 benchmarking document³. This document describes the knowledge, skills and competences of radiographers in Europe. The purpose of this document is to serve as point of reference and benchmark for educational institutions, employers and professional bodies in Europe. The three universities meet the learning outcomes, described in this EQF-document.

The Bachelor programme Medical Imaging and Radiotherapy in the Netherlands focuses on educating the radiographer as defined in the professional profile of the NVMBR⁴ (Dutch professional society of Medical Imaging and Radiotherapy) and the European Bachelor-Master structure, according to the Bologna declaration⁵.

Graduates of the Bachelor programme Medical Imaging and Radiotherapy in the Netherlands have been educated and trained to be professionals in producing images for medical diagnostics and applying radiotherapy treatment. In addition graduates have been educated and trained to apply the principles of radiation protection in practice.

The radiographer is capable to provide a professional and innovative contribution to health care as regards medical imaging and radiotherapy techniques.

Part B Professional profile and competences

The professional profile was established based on the vision document 'occupational structure' that NVMBR has developed in cooperation with the relevant Scientific Societies. It contains a structured description of professional qualifications and professional activities taking place in the professional practice of radiographers.

The professional profile describes all professional competences that a radiographer has mastered. Competences are seen in realistic, job-specific situations requiring context-specific actions of the radiographer. The professional profile is leading to define the minimum learning outcomes for the educational programme including ten competences in the educational programme. These ten competences are the proven ability to use knowledge, skills and personal social and methodological abilities (attitude) in work or study situations and in professional and personal development.

These ten competences were updated in 2009⁶. The competences of the Bachelor programme meet the requirements and frameworks of the Accreditation Organisation of the Netherlands and Flanders (NVAO) established by the Dutch and Flemish governments as an independent accreditation organization. The NVAO tasked with providing an expert and objective assessment of the quality of higher education in Flanders and the Netherlands.

The competences of the Bachelor programme are consistent with the general, internationally accepted descriptions of Bachelor qualifications, described as Dublin descriptors⁷.

Overview: Dublin descriptors

1. Knowledge and understanding
2. Applying knowledge and understanding
3. Communications
4. Judgment
5. Learning Skills

In order to facilitate diploma recognition, the National Transcript (2014) spells out these competences in the underlying body of knowledge, skills and attitude.

Competences Bachelor programme Medical Imaging Radiotherapy

Description of the competences:

- competence 1: patient-focussed provision of care
- competence 2: methodical and professional action
- competence 3: safe and preventive action
- competence 4 : organizing and managing an operational situation
- competence 5: communicating and instructing
- competence 6: observing and developing policy
- competence 7: collaboration
- competence 8: applied research
- competence 9: quality assurance and innovation
- competence 10: learning, evaluating and shaping once own professional practice and the profession itself.

The tables below describes the content of each competence:

Competence 1: Patient-focused provision of care

The Bachelor's in Medical Imaging and Radiotherapy:

- takes into account, from the perspective of the patient*, the medical/technical and psychosocial aspects of the examination or treatment while it is being conducted.
- maintains an optimal balance between the medical/technical and psychosocial aspects of the examination or treatment while it is being conducted.
- informs, encourages, advises and supports the patient before, during and after the examination and/or treatment.
- establishes an effective examination or treatment relationship with the patient.
- provides the necessary (nursing) care and aftercare for the patient, tailored to his/her needs, as part of the examination and/or treatment.
- explains his actions to the patient.
- addresses and treats the patient with respect.
- coordinates the provision of care and ensures a correct hand-over.

**Where the terminology 'patient' is used, this also refers to those accompanying the patient*

Competence 2: Methodical and professional action

The Bachelor's in Medical Imaging and Radiotherapy:

- selects and argues a suitable examination approach or treatment on the basis of (one's own) analysis of a question and/or indication, gives an account of this and advises accordingly.
- working in an independent, methodical and evidence-based manner, prepares a medical imaging examination or treatment (with ionizing radiation, magnetic resonance or ultrasound), carries this out, processes the obtained images, analyses and judges these in terms of quality, completes the examination or treatment and reports accordingly.
- applies imaging techniques during examinations, treatments and interventions conducted by medical specialists.
- administers and archives patient data, examination and treatment data.

Competence 3: Safe and preventive action

The Bachelor's in Medical Imaging and Radiotherapy:

- works in a safe manner when carrying out medical imaging examinations and treatments with ionizing radiation and magnetic resonance, taking into account current safety standards, guidelines and regulations.
- coordinates the process of creating and guaranteeing maximum safety for the patient, oneself and others during medical imaging examinations and treatments with ionizing radiation and magnetic resonance and can maintain the ALARA principle here.
- responds appropriately to contra-indications, complications and emergencies.
- works in a hygienic and prevention-oriented manner and helps to prevent diseases and illness.

Competence 4: Organizing and managing an operational situation

The Bachelor's in Medical Imaging and Radiotherapy:

- organizes his activities in an effective and efficient manner.
- fulfils a coordinating function by carrying out administrative and coordinating tasks:
- defines examination and treatment cycles in terms of time, taking into account priorities, available staff and material possibilities.
- coordinates use of rooms, equipment, materials and resources to facilitate an examination and/or treatment.
- manages the use and consumption of resources and materials so as to ensure clarity regarding the use, application and availability of the remaining resources and materials.

Competence 5: Communicating and instructing

The Bachelor's in Medical Imaging and Radiotherapy:

- communicates (verbally and in writing) and participates in a multidisciplinary, multicultural and/or international environment with regard to profession-related issues.
- communicates with, advises and instructs other professional groups on profession-related issues and ensures an appropriate chain of care.
- instructs staff and contributes to the promotion of their expertise.
- supplies third parties with information and education tailored to the target group.
- describes new developments or innovations relating to profession-related issues in a national or international context in a factually correct, understandable and accessible manner.

Competence 6: Observing and developing policy

The Bachelor's in Medical Imaging and Radiotherapy:

- acts on the basis of a critically reflective attitude and takes into account the professional code, rules of behaviour, reserved procedures and legal frameworks.
- participates in a work environment.
- makes a contribution to optimizing the policy of a department by:
- noting and drawing attention to relevant social and political developments and translating these into policy plans at departmental level.
- noting bottlenecks and suggesting possible solutions.
- making a contribution to optimizing the operational policy of a department.
- conducts leadership and management tasks or elements of these tasks.
- integrates – while maintaining one's own professional responsibility and legal position – the operational policy of an institution or department into one's own actions.

Competence 7: Collaboration

The Bachelor's in Medical Imaging and Radiotherapy:

- functions both independently and as part of a team within a work organization.
- makes an appropriate and argued contribution within a multidisciplinary team.
- contributes to an effective interdisciplinary, multicultural and/or international collaboration and chain of care.
- functionally attunes one's own professional actions within the confines of one's expertise and abilities to the actions of other members of the multidisciplinary team.
- integrates instructions and/or directives from the staff of one's own or other departments into one's own actions.
- contributes to team development and conflict resolution.

Competence 8: Applied research

The Bachelor's in Medical Imaging and Radiotherapy:

- applies available relevant national and international (scientific) insights, theories, concepts and research results to issues with which radiographers are confronted in their professional practice.
- when taking decisions about care for (individual) patients, makes use of relevant national and international (scientific) insights, theories, concepts and research results and integrates these approaches in one's own professional actions (evidence-based practice).
- carries out short-term and practice-oriented research, either independently or in collaboration with colleagues, to improve the quality of care.
- participates in applied research for the further development of professional practice and its scientific foundation.
- presents and publishes results of applied research.

Competence 9: Quality Assurance and Innovation

The Bachelor's in Medical Imaging and Radiotherapy:

- contributes to the content-related development and profiling of the profession by initiating and implementing quality management and innovation processes.
- within a multidisciplinary collaborative context, contributes to evaluation, improvement and maintenance of the quality of professional practice.
- notes new developments and implements new guidelines in professional practice.

Competence 10: Learning, evaluating and shaping one's own professional practice and the profession itself

The Bachelor's in Medical Imaging and Radiotherapy:

- plays an active role in promoting one's own professional awareness and in developing one's (Bachelor programme or professional) competencies.
- evaluates one's own actions by assessing and reflection.
- manages one's own career (development) as a professional.
- on the basis of an active learning attitude, translates trends and developments in professional practice (national and international) into one's own professional practice.
- working within a multidisciplinary team, evaluates the organizational, content-related and methodical aspects of professional practice.
- translates, in situations involving supervision between colleagues, given and received feedback into feasible and realistic activities for achieving improvement.

In the context of the profession, the competences of the radiographer are arranged according to the three roles the radiographer performs in his work: 'allied health care provider, 'professional' and 'organizer'.

The role of 'allied health care provider' focuses on the primary process as a radiographer.

Central in the primary process are the professional and patient-oriented care.

The role of the 'professional' radiographer focuses on applied research, innovations, quality management and life-long-learning.

The role of 'organizer' focuses on collaboration, communication and to managing an inter- and multidisciplinary environment. These are complementary roles and merge in daily practice. To a great extent these roles correspond to the professional roles as defined in the professional profile of the radiographer.

The table below provides an overview of the Bachelor programme competences, professional roles in relation to the Dublin descriptors areas of the radiographer and the roles of the radiographer.

Professional profile for radiographer		Bachelor programme	
Roles of radiographer	Competence areas of radiographer	Competences	Dublin descriptors
The radiographer as an allied health care provider	1. Patient-focused action	1. Patient-focused provision of care	1, 2, 3, 4
	2. Medical imaging action	2. Methodical and professional action	1, 2, 3
	3. Therapeutic action	3. Safe and preventive action	1, 2, 4
		4. Organizing and managing an operational situation	1, 2
The radiographer as an organizer	4. Collaboration	5. Communicating and instructing	3
	5. Management	6. Observing and developing policy	1, 2, 3, 4
		7. Collaboration	3
The radiographer as a professional	6. Teaching and supervision	8. Applied research	1, 2, 3, 4
	7. Research	9. Quality assurance and innovation	1, 2, 3, 4
	8. Innovation	10. Learning, evaluating and shaping one's own professional practice and the profession itself	4, 5

Part C Body of knowledge, skills and attitude

Referring to part B the competences consists of the body of knowledge, skills and attitude. The body of knowledge, skills and attitude are subdivided into categories and subcategories. The overlap in knowledge and skills in all fields of radiography leads to an integrated approach of the provision of educational content.

C.1 Content Bachelor Medical Imaging and Radiotherapy

Paragraph C1 refers to the categories en subcategories, related to competences and linked to the fields of radiography : radiodiagnostics, radiotherapy, nuclear medicine, magnetic resonance imaging and ultrasound. The content and size of the categories is listed below. As already expressed in the introduction section, the base of the programme amongst the three universities is the same, but the scope can vary for each curriculum. The scope is therefore expressed in a minimum and maximum number of credits, according to the European Credit Transfer System, with 1 credit equal to 28 hours of study.

Category A	Subcategory A	ECTS range
Anatomy (including descriptive, topographic and projective), physiology, pathology (oncology), and aetiology	<ul style="list-style-type: none">• cellular biology• <i>locomotoric system</i>• <i>digestive system</i>• <i>circulatory system</i>• <i>uroepoetic and genital system</i>• <i>endocrine system</i>• <i>respiratory system</i>• <i>nervous system</i>• sensory system• mammae• skin	9-12

Category B	Subcategory B	ECTS range
Basic physics & applied physics for all modalities in the fields of medical imaging and radiotherapy, including hybrid systems	<ul style="list-style-type: none"> • construction and operation of equipment • image acquisition and reconstruction parameters • (post) processing • image quality • contrast media • radio pharmacy • procedures and protocols • beam characteristics • localisation and planning 	15-16

Category C	Subcategory C	ECTS range
Applied knowledge / insight / skills for all modalities in the fields of medical imaging and radiotherapy, including hybrid systems	<ul style="list-style-type: none"> • handling of equipment • use of additional devices • acquisition and processing of images • use of contrast media • performing quality control and assurance • positioning of patients and scanning techniques • radiotherapy planning & treatment (IMRT & IGRT) 	29

Category D	Subcategory D	ECTS range
Image recognition & interpretation	<ul style="list-style-type: none"> • anatomy • pathology • physiology (bio distribution) • technical aspects of image quality 	10-11

Category E	Subcategory E	ECTS range
<i>Radiation protection</i>	<ul style="list-style-type: none"> • <i>molecules and atoms</i> • <i>radioactivity</i> • <i>direct and indirect ionizing radiation</i> • <i>detection of radiation</i> • <i>interaction with matter</i> • <i>(patient) dosimetry</i> • <i>radiobiology</i> • <i>radiation shielding</i> • <i>legislation</i> • <i>recommendations ICRP</i> • <i>applied radiation protection</i> 	15-16

Category F	Subcategory F	ECTS range
<i>nursing / posture skills</i>	<ul style="list-style-type: none"> • <i>application of basic nursing procedures</i> • <i>dealing with sterility</i> • <i>dealing and handling contamination risks and prevention</i> • <i>interpretation and anticipation in relation to vital signs</i> • <i>preparing infusions and injections</i> 	1-2

Category G	Subcategory G	ECTS range
<i>Communication / social skills</i>	<ul style="list-style-type: none"> • <i>communication techniques</i> • <i>oral and written communication skills</i> • <i>information and instruction skills</i> 	1-2

Category H	Subcategory H	ECTS range
<i>Interpersonal skills</i>	<ul style="list-style-type: none"> • <i>personal development</i> • <i>learning style</i> • <i>reflection and evaluation</i> • <i>competence development</i> • <i>behaviour development</i> • <i>interviewing</i> • <i>professional conduct</i> 	10-11

Category I	Subcategory I	ECTS range
<i>Governance / policies</i>	<ul style="list-style-type: none"> • <i>health care organisation and policy</i> • <i>management</i> • <i>ethics</i> • <i>EU - directives / national legislation</i> • <i>quality in healthcare and quality assurance</i> 	5-8

Category J	Subcategory J	ECTS range
<i>Workplace /clinical placement</i>	<ul style="list-style-type: none"> • <i>clinical placement a minimum of two different domains</i> 	56-60

Category K	Subcategory K	ECTS range
<i>Elective programme</i>	<ul style="list-style-type: none"> • <i>The elective programme is a part of the study where the student has a free choice of subject. Most students choose a programme close to the profession, or to pursue personal interests, or to specialize in a certain field of the radiography profession. See the diploma supplement for a specification of the elective programme.</i> 	35-40

Category L	Subcategory L	ECTS range
<i>Applied research</i>	<ul style="list-style-type: none"> • <i>Research methods</i> • <i>evidence based practice</i> • <i>source accountability</i> • <i>statistics</i> • <i>projects</i> • <i>Bachelor thesis</i> 	34-37

Total number of ECTS	240
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Literature

1. Directive 2005/36/EC, Official Journal of the European Union, 2005;
2. The European Qualifications Framework for Lifelong Learning (EQF), EUROPEAN COMMISSION Education and Culture, 2008;
3. EQF Benchmarking document Radiographer, EFRS, 2014
4. Beroepsprofiel Medisch Beeldvormings- en Bestralingsdeskundige (MBB'er), NVMBR, 2011;
5. The Bologna Declaration, The European Higher Education Area, 1999
6. Competenties in Beeld, MBRT opleidingen Fontys hogescholen, hogeschool Inholland en Hanze hogeschool, 2009
7. Bologna Framework and Certification revised 29-02-08

