

FEATURES

- **Post graduate distance learning program**, accredited by the German Accreditation Institute (ACQUIN), delivered in English terminating with a Master's of Science degree from a top-ranking university with a longstanding reputation for excellence in teaching and research.
- **Flexible online and on-site program** of study including internships at the leading-edge medical facilities DKFZ, HIT and Heidelberg University Hospital.
- **Hands-on practical training** at the world's prototype ion beam facility, HIT, including advanced beam scanning techniques and an isocentric gantry providing beams of protons, carbon, helium and oxygen.
- **Meet pioneering experts** with longstanding experience in IMRT, ion beam scanning and treatment planning as well as radiobiological modeling.
- **Promising new career prospects** for APMR graduates in teaching, research or care services in medical centers, national laboratories, academic institutions, governmental regulatory agencies, and in medical and nuclear industrial facilities.

FACTS

- Program duration: 4 semesters
- Fee for regular 4-semester course: € 16,426 (from winter semester 2011)
Longer duration will cause higher costs.
- Program start: October of every academic year
- Maximum number of participants: 20
- Application deadline: July 15 (later applications may be accepted depending on number of participants)
- **New:** Continuing professional development (CPD) opportunities are available for individual taught modules at a fee of € 2,700 per module

Interested? Why not give us a call at +49 (0)6221 54-7812/13 or send an email to apmr@uni-hd.de

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PROGRAM LEADERS



Prof. Dr. Dr. Jürgen Debus

Professor for Radiation Oncology at the Medical Faculty Heidelberg, Heidelberg University
Medical Director of the Department of Radiation Oncology and Radiation Therapy, Heidelberg University Hospital and CEO of HIT GmbH, Heidelberg



Prof. Dr. Wolfgang Schlegel

Professor for Medical Physics at the Medical Faculty Heidelberg, Heidelberg University
Head of the Department of Medical Physics in Radiation Oncology, DKFZ, Heidelberg



Prof. Dr. Oliver Jäkel

Professor for Medical Physics at the Medical Faculty Heidelberg, Heidelberg University
Medical Physics Director of HIT GmbH, Heidelberg
Group Leader "Heavy Ion Therapy", DKFZ, Heidelberg

Contact:

Heidelberg University
Postgraduate Scientific Studies
Bergheimer Str. 58, Building 4311
D - 69115 Heidelberg

Tel.: +49 (0) 6221 54-7812/13

Fax: +49 (0) 6221 54-7819

apmr@uni-hd.de
www.apmr.uni-hd.de

Accredited by
ACQUIN



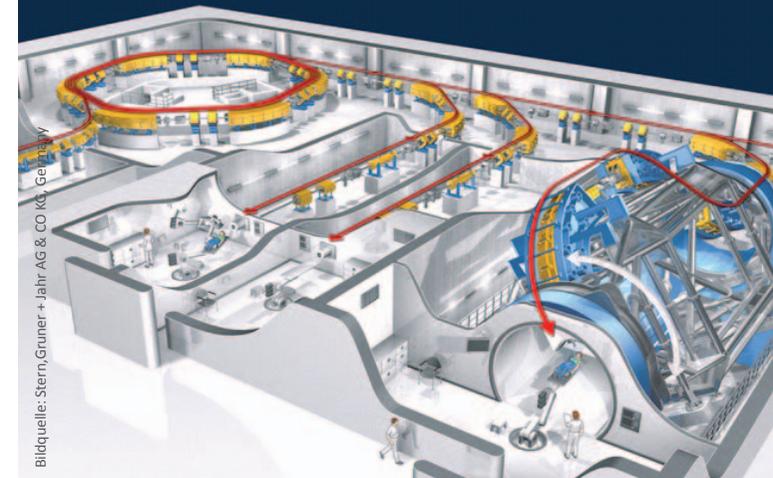
Medizinische Fakultät Heidelberg



MASTER ONLINE

ADVANCED PHYSICAL METHODS IN RADIOTHERAPY

Distance learning MSc program in medical physics



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GERMAN
CANCER RESEARCH CENTER
IN THE HELMHOLTZ ASSOCIATION

PROGRAM DESCRIPTION

Introduction

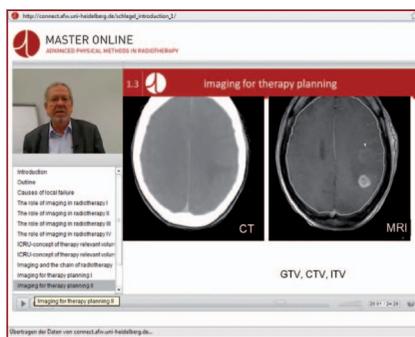
The Master Online Advanced Physical Methods in Radiotherapy (APMR) at the top-ranking University of Heidelberg is a unique postgraduate program in the field of medical physics delivered predominantly online. This English-speaking distance learning program is the result of a long-term collaboration between the widely acclaimed German Cancer Research Center (DKFZ), the distinguished Heidelberg University Hospital and the new state-of-the-art heavy ion facility, Heidelberg Ion-Beam Therapy Center (HIT).

What else makes our program so unique?

Advanced technology in clinical practice plays an increasing role in the optimum care and treatment of cancer patients. Unlike any other program, APMR offers students advanced practical training at cutting-edge radiotherapy facilities in Heidelberg reinforced by rigorous, theoretical online instruction from 60+ internationally based teaching staff and prominent experts in the disciplines of radiology, radio oncology, radiation safety and medical physics. Graduates of APMR will be equipped with the specialized technical skills underpinned by a solid theoretical grounding in advanced cancer treatment techniques such as intensity modulated and image guided radiotherapy (IMRT, IGRT) and proton and heavy ion therapy. A shortage of specialists at the growing number of ion beam facilities in Europe is already imminent and this is where APMR can contribute to filling the widening gap.

Mode of study

APMR is a distance learning program tailored to fit the adult learner's busy schedule! APMR is delivered predominantly online (80%) with periodic practical training sessions at the HIT facility and further modern radiotherapy units (20%). By making effective use of online technology students have access to a flexible and supportive virtual learning and teaching environment (see image). Web discussion activities and online seminars foster collegiate communication and collaboration with teaching experts and peers at times that suit students' individual needs.



MODULES OF STUDY

M 1 Anatomy and Imaging for Radiotherapy

We will refresh your anatomical knowledge and you will be exposed to the latest improvements in radiological imaging, including modern X-ray CT, dual energy CT, morphological and functional MRI and MR spectroscopy, as well as in modern techniques in molecular imaging. The knowledge gained will form the basis for the understanding and application of the new treatment techniques.

M 2 Intensity Modulated Radiotherapy

After an overview of the basic features of IMRT, you will be introduced to the different technical implementations of modern IMRT and to applications in clinical practice. Building upon problem- and work-based scenarios you will have the unique opportunity to gain hands-on experience at our facilities and to discuss your activities on-site with the IMRT innovators.

M 3 Ion Therapy

You will reinforce your knowledge about the basic physical interaction of protons and ions and discover how these can be harnessed to the benefit of the patient. An understanding of these interactions also forms the basis for the biological effects of high LET radiation, which you will study in detail. You will be introduced to vital technical features of accelerators, beam delivery systems and also to treatment planning and the implications for clinical practice.

M 4 Image Guided Radiotherapy and Adaptive Radiotherapy

More recently IGRT has become an important new paradigm. You will discover that applications of IGRT are not merely restricted to accurate patient positioning, but include further the resolution of inter- and intrafractional motion in order to arrive at a true 4D dose conformation. The basics of modern biological imaging techniques and their implication for radiotherapy will also be explored.

M 5 Advanced Dosimetry and Quality Assurance

The highly advanced techniques of IMRT, IGRT and ion beam therapy require complex solutions for dosimetry and quality assurance. You will scrutinize relevant guidelines for the design of dedicated QA procedures adapted to the unique requirements of these modern techniques. Dosimetric principles will be studied in-depth and then applied to special dosimetry techniques for small fields, ion dosimetry and dynamic fields. Finally, you will find yourself working side by side with world renowned experts during the practical training sessions at our flagship facilities.

M P Internships

Treatment Planning | IMRT | ART | Ion Therapy | Dosimetry and QA

M T Master's Thesis

Topic to be selected from modules 1 - 5.

PROGRAM STRUCTURE

Semester	Modules	ECTS Credits
	Induction: Attendance phase (1.5 days)	
1	M 1 Anatomy and Imaging for Radiotherapy Attendance phase M1 (1.5 days)	M 2 Intensity Modulated Radiotherapy (IMRT) 15
2	M 3 Ion Therapy Attendance phase M2, M3 (4 days)	M 4 Image Guided Radiotherapy (IGRT) and Adaptive Radiotherapy (ART) 15
3	M 5 Advanced Dosimetry and Quality Assurance (QA) Attendance phase M4, M5 (4 days)	M P 4 Internships Attendance phase (12 days) 15
4	M T Master's Thesis	30
		Σ 75
Pre-requisites	<ul style="list-style-type: none"> Degree of higher or further education institute (Bachelor, Diploma, Master) Proof of at least two years of professional experience following the first degree Competency in medical physics subject to scrutiny by submission panel 	45
		Σ 120



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ADVANCED PHYSICAL METHODS IN RADIOTHERAPY



Dr. Christina Mainka

E-Learning Coordinator APMR



Marcel Schäfer

Program Coordinator APMR

Contact:

Heidelberg University
Postgraduate Scientific Studies
Bergheimer Str. 58, Building 4311
D - 69115 Heidelberg

Tel.: +49 (0)6221 54-7812/13

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Not sure if an online program is right for you?

ONLINE
TASTER COURSE

Why not sign up for the **APMR Taster Course**? It's free and offers prospective students a hands-on, week-long opportunity to experience online study in the program's dedicated virtual learning environment (VLE). Alternatively, join APMR program staff, Christina Mainka and Marcel Schäfer, with your concerns and questions for a live **Online Info Session** on one of the following dates in 2011:

Thursday, May 26th, from 6.00 – 8.00 pm

Tuesday, June 21st, from 8.00 – 10.00 pm

Sunday, July 10th, from 4.00 – 6.00 pm (GMT+1 hr)

**Hurry! Register now at email apmr@uni-hd.de
or give us a call at +49 (0)6221 547812/13 to secure your place.**

