ESMPE European School for Medical Physics Experts

Dosimetry in Medical Physics

4th-6th February 2027, Prague, Czech Republic

EFOMP would like to invite you to the ESMPE European School for Medical Physis Experts On Dosimetry in Medical Physics on 4th-6th February 2027. This course provides a comprehensive introduction to photon dosimetry in diagnostic radiology and radiotherapy applications. Participants will review the fundamental principles of radiation measurement, dose quantities, dosimeters technologies, calibration procedures, uncertainty evaluation and dosimetric protocols used in radiotherapy, conventional X-ray imaging, computed tomography (CT), mammography, fluoroscopy and interventional radiology. The course will include the practical application of international recommendations, such as IAEA TRS-398 for reference dosimetry in external beam radiotherapy and IAEA TRS-457 for dosimetry in radiology, together with current approaches to CT and breast dosimetry, diagnostic reference levels, patient dose assessment, image quality–dose optimization in modern medical imaging and radiation therapy.

This two-and-half day event will be accredited by EBAMP (European Board of Accreditation for Medical Physics) and is intended for practicing clinical Medical Physicists who are involved or interested in dosimetry in radiotherapy and diagnostic radiology. There will be an optional examination at the end for those seeking a higher level of certification beyond attendance.
ESMPE have decided this event will be in a hybrid format. All lecturers will give their talks on-site in Prague, Czech Republic, but participants can choose if they want to attend the school on-site or online, it will be live-streamed.

Please note: All times shown are in CET (local time in Prague)

Content
Basic principles of dosimetry
Dosimeters and instrumentations
Dosimetry in radiotherapy
Dosimetry in radiology (CT, mammography, angio, general radiology)
Dose optimization

Final examination
The final exam is voluntary. Participants can gain additional credits when successfully pass the test.

Organisers
Valentina Ravaglia, Marco Fusella (Scientific Chairs)
Joao Seco (Chair of the School)

Local organisers
Jaroslav Ptáček (CAMP)

Thursday 4th February 2027				
CET	**Session**	**Title**	**Description**	**Lecturer**
8:00-9:00	*Registration*			
9:00-9:15	Introduction	Setting the scene	Presentation of the ESMPE and introduction to the course	
9.15-10.00	Basic principles of x-ray interactions	Basic principles of x-ray interactions	Basic principles of x-ray interactions (photoelectric effect, compton scattering, etc.)	
10:00-10.30	*Coffee break*			
10:30-11:15	Basic dosimetry	Dosimetric Quantities and Fundamental Principles of Dosimetry	Review of the fundamental dosimetric quantities (kerma, absorbed, equivalent and effective dose) and introduction to the physical principles underlying radiation dosimetry (charged particle equilibrium, cavity theory, Bragg-Gray etc.)	
11.15-12.00	Dosimetry instrumentation for radiotherapy and radiology	Dosimeters: Types, Characteristics and Instrumentation	Overview of dosimeters (ionization chambers, solid-state detectors, TLD, film), principles, performance characteristics (accuracy, linearity, energy dependence) and instrumentation for dose measurement and quality assurance	
12:00-12:30			Question & Answer discussion on the morning lectures	All Faculty
12:30-14:00	*Lunch break*			
14.00-14.45	Dosimetry instrumentation	Metrological Traceability	Overview of primary calibration laboratories, reference standards, calibration procedures, and metrological traceability in medical dosimetry. The role of primary standards in establishing and transferring dose measurements to clinical practice	
14.45-15.15	Dosimetry uncertainties	Dosimetry uncertainties	Uncertainties analysis of dosimetric data	
15:15-15:45	Coffee break			
15:45-16:30	Dosimetry in Radiotherapy	Reference Dosimetry Protocols in External Beam Radiotherapy	Introduction to reference dosimetry protocols in external beam radiotherapy (IAEA TRS-398 Rev. protocol): absolute dose calibration in reference conditions, beam quality specification etc.	
16:30-17:15	Dosimetry in Diagnostic Radiology	Dosimetry in Diagnostic Radiology	Overview of the main dosimetric quantities used in diagnostic radiology, including air kerma, entrance surface dose, DAP (IAEA TRS-457)	
17.00-17.30			Question & Answer discussion on the afternoon lectures	All Faculty
20:00-23:00	Social dinner - participants + lecturers			

Friday 5th February 2027				
CET	**Session**	**Title**	**Description**	**Lecturer**
09:00-09:45	Dosimetry in small field and special practices radiotherapy	Small Field Dosimetry in Modern Radiotherapy	Overview of the dosimetric challenges associated with small photon fields, including loss of charged particle equilibrium, detector selection, perturbation effects, correction factors. Introduction to current approaches to small-field dosimetry, the main critical aspects and practical challenges	
09:45-10:30		Dosimetry in Special Radiotherapy Practices	Dosimetric challenges in emerging radiotherapy techniques, with a focus on FLASH and spatially fractionated radiotherapy. Principles, measurement approaches, and specific dosimetric requirements	
10:30-11.00	*Coffee break*			
11:00–11:30	Dosimetry in radiology and interventional radiology	Dosimetry in Fluoroscopy and Interventional Radiology	Overview of patient dosimetry in fluoroscopically guided procedures, including real-time dose monitoring, cumulative air kerma at the interventional reference point, and peak skin dose	
11:30-12:00		Breast dosimetry	Overview of breast dosimetry in mammography, comparing old and new models to glandular dose estimation	
12:00-12:30			Question & Answer discussion on the morning lectures	All Faculty
12:30-14:00	*Lunch break*			
14:00-14:45	Dosimetry in CT and CBCT	CT dosimetry	Overview of CT dosimetry and dose indexes (CTDIvol, DLP, SSDE) and their limitations in modern wide-beam CT systems	
14:45-15:15		CBCT Dosimetry in Radiology and Radiotherapy	Overview of dosimetric principles and clinical applications of cone-beam CT (CBCT) in diagnostic radiology and radiotherapy	
15:15-16:00	Commissioning	Commissioning	Principles and practical aspects of commissioning in radiotherapy: methods, instruments and acceptance criteria (TRS, TG51, TG 119)	
16:00-16:30	*Coffee break*			
16:30-17:15	Commercial equipment overview	Dosimetry equipment for radiology and radiotherapy	Presentation of dosimetry equipment, ionization chambers and QA systems with an overview of available solutions and their applications in radiotherapy and diagnostic radiology	Vendors
17.15-17:45			Question & Answer discussion on the afternoon lectures.	All Faculty

Saturday 6th February 2027				
CET	**Session**	**Title**	**Description**	**Lecturer**
09:00-09.45	Dose optimization in Radiotherapy and Diagnostic Radiology	Dose optimization in Radiotherapy	Dose calculation algorithms, and patient-dose optimization and patient-specific quality assurance	
09:45-10:30		Dose optimization in Diagnostic Radiology	From measured physical quantities to the estimation of patient dose. Diagnostic Reference Levels and examples of optimization in CT, pregnancy, and paediatric imaging	
10:30-11:00	*Coffee break*			
11.00-11.45	Low-Dose Radiobiological Effects in Diagnostic Imaging and Radiotherapy	Low-Dose Radiobiological Effects in Diagnostic Imaging and Radiotherapy	Overview of low-dose radiobiological effects and radiation-induced risks in diagnostic imaging and radiotherapy, including secondary radiation, out-of-field exposure and their contribution to cancer risk	
11.45-12.15			Dose monitoring and imaging dose optimization: there is a need in RT?	Round table/ Optmize-RT project
12.15-12.45			Question and Answer discussion on the afternoon lectures	All Faculty
13.00-14:00	*Final examination (optional ; for those seeking a higher number of CPDs beyond attendance)*			

Course language	English
Level	Medical Physics / Medical Physics Expert
Registration fee* (2 main meals, 5 coffee breaks, 1 social dinner)	350 € (*VAT included)
Reduced registration fee* · subsidized by EFOMP · first-come, first-served policy	200 € (*VAT included) - for the first 40 participants (max. 3 from one country) coming from the following European countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Hungary, Latvia, Lithuania, Moldova, North Macedonia, Poland, Portugal, Romania, Serbia, Slovak Republic, Spain, Ukraine. 200 € (*VAT included) - for 30 young persons (under 35y)
Maximum number of on-site/online participants	60/90
Duration	4th - 6th February 2027
Study load	
Venue	Department of Dosimetry and Application of Ionizing Radiation, Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague, Břehová 7, 115 19 Prague 1,CZECH REPUBLIC 50°5'27.737"N, 14°24'58.713"E
Accommodation	Participants must book their own accommodation.
Information, programme at:	www.efomp.org
Registration	Electronic registration via EFOMP website
Registration period	17th July 2026 – 22nd January 2027 (29th January 2027 for online participation only)

***** payment must be done in 7 days following the pre-registration, otherwise pre-registration will be cancelled and neither free place nor subsidized or ordinary fee can be granted for repeated registration

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