

Schedule for the ground course on *Radiation Dosimetry*, FK5031, 7.5 ECTS, Spring 2025

Lecture room: MSF Lecture Room (Bo Nilsson)

Week	Day	Date	Time	Lecture title or other specified activity	Lecturer	Literature
4	Monday	20.01	12:30-13:00	Introduction to course	HB	
			13:00-16:00	Lecture: Radiation field and dosimetric quantities	ML	Attix 2.4; Podgoršak IAEA Chapter 2, Andreo 4
	Wednesday	22.01	13:00-16:00	Lecture: Relation between field and dosimetric quantities. Radiation equilibria	ML	Attix 2.4; Podgoršak IAEA Chapter 2; Andreo 4
	Friday	24.01	09:00-12:00	Lecture: Microdosimetry	MRE	ICRU 36; Lindborg 1+2
			13:00-16:00	Lecture: Microdosimetry cont.	MRE	
5	Monday	27.01	09:00-12:30	Lecture: Cavity theory	HB	Andreo 9 Podgoršak 2.8
			13:30-16:30	Lecture: Ionization chambers	HB	Andreo 12, notes, IAEA Podgoršak Chapter 3.3 and Chapter 9
	Wednesday	29.01	09:30-12:30	Lecture: Overview of radiation detection	HB	Podgoršak Chapter 3, 8.1, 8.2. IAEA TRS-398 sections on radiation quality for kV and MV beams, Parts from Andreo 10
			13:30-16:30	Calculation exercises: kerma, CEMA, cavity theory	HB	
	Thursday	30.01	09:30-12:30	Lecture: Radiation metrology standards	HB	Andreo 11, IAEA Podgoršak Chapter 3.8 and Chapter 9
			13:30-16:30	Lecture: TLD and EPR dosimetry	HB	Andreo 13.5, 14.2, IAEA Podgoršak 3.5, 3.7.1
6	Monday	03.02	09:30-12:30	Calculation exercises: ionization chamber dosimetry	HB	
			13:30-16:30	Lecture: Proton and Neutron dosimetry	HB	ICRU Report 45, especially chapter 3, Andreo 19
	Tuesday	04.02	10:00-12:00	Introduction to PENELOPE and the MC lab exercise	LN	
	Wednesday	05.02	09:00-16:00	Lab 1: Interface dosimetry MC calculations Groups 1-4	LN	
	Friday	07.02	09:30-12:30	Calculation exercises: proton and neutron dosimetry	HB	
			13:30-16:30	Scientific paper presentations	HB	
7	Monday	10.02	16:00-18:00	Lab 2: Ionization chamber dosimetry Group 3 (NKS)	SK+ MG	
	Tuesday	11.02	16:00-18:00	Lab 2: Ionization chamber dosimetry Group 3 (NKS)	SK+ MG	
	Wednesday	12.02	16:00-18:00	Lab 2: Ionization chamber dosimetry Group 3 (NKS)	SK+ MG	
	Tuesday	13.02	16:00-18:00	Lab 2: Ionization chamber dosimetry Group 3 (NKS)	SK+ MG	
	Friday	14.02	10:00-12:00	Lecture: Semiconductor dosimeters	AD	
8	Friday	21.02	09:00-15:00	Exam	HB	

Lecturers:

HB Hamza Benmakhlouf, Senior Lecturer, Stockholm University (course coordinator and main teacher)

AD Alexandru Dasu, Adjunct Senior Lecturer, Skandion Clinic

ML Marta Lazzeroni, PhD, Senior Lecturer, Stockholm University
MRE Maite Romero-Expósito, PhD, Researcher, Skandion Clinic

Lab supervisors:

SK PhD-student Suryakant Kaushik - *Ionization chamber dosimetry*
MG PhD-student Mohammed Ghazal – *Ionization chamber dosimetry*
LN PhD-student Ludwig Neste - *Interface dosimetry with MC calculations*

Literature:

P. Andreo, D. T. Burns, A. E. Nahum, J. Seuntjens and F. H. Attix "Fundamentals of Ionizing Radiation Dosimetry", Wiley 2017
Bo Nilsson Exercises with Solutions in Radiation Physics, De Gruyter 2015
ICRU Reports 45, 85
Lecture notes and copied material

Consultation and further reading:

F. H. Attix Introduction to Radiological Physics and Radiation Dosimetry, Wiley 1986
ICRU Reports 35, 36, 64, 10b
J R Greening Fundamentals of Radiation Dosimetry Adam Hilger 1981
F. H. Attix, W. C. Roesch and E. Tochilin (eds) Radiation Dosimetry 2nd ed Vols 1-3 Academic Press 1969

Relevant dosimetry chapters in:

E Podgorsak (ed) Radiation Oncology Physics: a Handbook for teachers and students IAEA 2005
(http://www-pub.iaea.org/MTCD/publications/PDF/Pub1196_web.pdf)
P Mayles, A Nahum and J-C Rosenwald (eds) Handbook of Radiotherapy Physics - Theory and Practice Taylor & Francis 2007
DWO Rogers and J-E Cygler Clinical Dosimetry Measurements in Radiotherapy Medical Physics Publishing 2009

Relevant microdosimetry literature:

Lindborg L. and Nikjoo H: Microdosimetry and radiation quality determinations in radiation protection and radiation therapy in Radiat. Prot. Dosim (pages 402 to 404 until "Experimental techniques" as mandatory reading for the Microdosimetry lecture, the rest of the paper for information)
Chapter 1 + 2 in "Microdosimetry - Experimental Methods and Applications" by Lennardt Lindborg and Anthony Walker,
CRC Press, ISBN 978-1-4822-1740-7. (will be handed out)