GS02 1213: Therapy Medical Physics
Summer 2022
Course Directors: Christopher Peeler, PhD and Shane Krafft, PhD

Date	Topic	Instructor
Week 1	Course Overview (Krafft/Peeler) – 30 min/Terminology and Introduction to Photon Dose Calculation Algorithms	Prajapati, Surendra
	Dose Calculation Algorithms for Clinical Photon Beams I: General C/S Concepts and Pinnacle	Prajapati, Surendra
	Dose Calculation Algorithms for Clinical Photon Beams II: RayStation CCCS, Eclipse AAA, Pencil Beam	Prajapati, Surendra
Week 2	Dose Calculation Algorithms for Clinical Photon/Electron Beams: Monte Carlo/Boltzman	Mirkovic, Dragan
	Intensity-Modulated Radiation Therapy I : Optimization and Inverse Planning	Krafft/Peeler/TBD
	Intensity-Modulated Radiation Therapy II: Delivery, IMRT vs VMAT, Tomotherapy and other delivery systems, MLC design, etc.	Krafft/Peeler/TBD
Week 3	IMRT TREATMENT PLANNING DEMO/LAB	Krafft/Peeler/TBD
	Stereotactic Radiosurgery I: Intro, indications, immobilization/fixation, planning/indices	Luo, Dershan
	Stereotactic Radiosurgery II: GK, CK, linac-based/multimet	Luo, Dershan
Week 4	Stereotactic Body Radiation Therapy: BED, Site specific planning/considerations	Martin, Rachael
	Motion Management and Surface Guided Systems (TG76, TG147)	Martin, Rachael
	IGRT I: Systems/Design/QA	Krafft/Peeler/TBD
Week 5	IGRT II: Dose (TG75, TG180)/Advanced - MR-Linac/Reflexion	Krafft/Peeler/TBD
	MR in RT I: Brief MR Intro, MR Sim, MR-Linac	Yang, Jinzhong
	MR in RT II: MR-Linac Cont/MR Biomarkers (TG284, TG294)	Yang, Jinzhong
Week 6	MIDTERM	---
	Proton I: Physics/Equipment	Sahoo, Narayan/Zhang, Xiaodong
	Proton II: Planning/Techniques, robust optimization	Sahoo, Narayan/Zhang, Xiaodong
Week 7	Proton III: QA/Misc	Sahoo, Narayan/Zhang, Xiaodong
	Proton/Heavy Ions: Advanced (RBE, heavy ions)	Peeler, Christopher
	PROTON DEMO/LAB	Krafft/Peeler/TBD
Week 8	Patient-specific QA I: tolerance limits, methodologies, rationale	Krafft/Peeler/TBD
	Patient-specific QA II: practical applications, devices	Krafft/Peeler/TBD
	Biologically Related Modeling/Treatment Planning (NTCP/TCP Modeling)	Krafft, Shane/Niedzielski, Josh
Week 9	AI and Automation I: Background, Physics role, Applications	Netherton, Tucker
	AI and Automation II: Image registration/fusion (TG132) and segmentation	Netherton, Tucker
	AI and Automation III: Auto Planning/Knowledge based planning	Netherton, Tucker
Week 10	FLASH: physics and technology	Schueler, Emil
	AAPM STUDENT PRESENTATIONS	---
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Week 11	REVIEW	---
	FINAL	---