

ADVANCED RADIATION PHYSICS INC.

2888 NW 30th Street, Boca Raton, FL 33434; Phone: 561-789-6642

Radiation Therapy Physics

Course fee:

- \$900.00
- A non-refundable fee of \$500 is required
- \$100 discount per course for Veterans and Military personnel.
- \$100 discount per person for a group of 4 or more.
- Remaining balance due two weeks before the class starts
- Use PayPal or send check to:

Advanced Radiation Physics Inc.

2888 NW 30th Street
Boca Raton, FL 33433-2432

- Send registration form by email to registration@thearpi.com

Course fee will include:

- Weekly class: 5:30 PM to 8:00 PM for 15 weeks
- Binder, CD, or electronic file with the course material
- Class offered online via webinar
- Study group organized from the first day of the course, with proposed structured schedule.

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Course details:

- Webinars offered at weekly
- You can hear all of us, see the teacher and the presentation constantly during the webinar
- Webinars are recorded and you can have them and listen as many times as you wish.
- Chat and documents will be shared by all the attendants from the first class of the year till the last one of the same year

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Texts:

- *The Physics of Radiation Therapy* (third edition); Faiz M. Khan
- TG 21, 25, 40, 43, 51, 66, 70, 116, 119, 142

References:

- *Radiation Therapy Physics* (Third Edition), William R. Hendee, Geoffrey S. Ibbott, Eric G. Hendee, John Wiley & Sons, Inc.
- *The Physics of Radiology*, J.R. Cunningham & H. E. Johns
- *Introduction to Radiological Physics and Radiation Dosimetry*, F. H. Attix
- *Medical Electron Accelerators*, C.J. Karzmark
- *Measurements and Detection of Radiation*, Second Edition, Nicholas Tsoulfanidis
- *Anatomy in Diagnostics Imaging*, P. Flechenstein, J. Trantum – Jensen
- *American Association of Physicist in Medicine (AAPM) – all TG reports, Handbook of Radiotherapy Physics*, by P. Mayles, A. Nahum, & J. C. Rosenwald
- *The Modern Technology of Radiation Oncology* Volume I and II, by Jacob Van Dyk (Editor), *The Physics of Radiotherapy X-rays and Electrons*, P. Metcalfe, T. Kron, P. Hoban
- *Radiobiology for the Radiologist*, by Erik J. Hall
- *Shielding Techniques for Radiation Oncology Facilities*, by Patton H. McGinley

Course description:

- Course covers the physics and clinical application external beam photon therapies with emphasis on dose calculation and measurement, linear accelerator mechanical description and generating megavoltage therapeutic beams.

Course objectives:

- At the end of this course the students should have a good understanding of the Megavoltage X-rays for the purpose of therapy and the generating, calculating and measuring dose

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Course outline:

- Week 1: General Physics: Types of radiation, activity and dose, decay schemes, photon interactions, radiation units, radiation in matter, absorption.
- Week 2: Radiation measurements, absorbed dose and Kerma, direct and relative measurements, TG 21 and TG 51
- Week 3: Measurement instruments: ionization chambers, diodes, TLDs, electrometers, calorimeters, survey meters
- Week 4: Radiation producers, X-ray kV sources, Imaging machines, kV machines
- Week 5: Linear accelerators, components, description and functions, beam quality
- Week 6: Photons: energies and depth doses, flatness, symmetry
- Week 7: Photons: percentage depth dose, isodose curves, inhomogeneities and dose absorption, total body irradiation
- Week 8: Electrons: energies and depth doses, flatness, symmetry, virtual SSD
- Week 9: Electrons: percentage depth dose, isodose curves, inhomogeneities and dose absorption, total skin electrons irradiation
- Week 10: Diagnostics imaging: CT, MRI: principles, techniques, types and usage;
- Week 11: Diagnostics imaging: PET, SPECT: principles, techniques, types and usage
- Week 12: Brachytherapy: Isotopes, HDR and LDR procedures, sources calibration and system QA
- Week 13: Radiobiological effects and radiation protection
- Week 14: Radiation safety: biological effects of radiation, beams quality, radiation protection and regulations, HAZMAT

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- Week 15: Shielding: requirements, calculations, acceptance survey, shielding reports

Silvia Pella, PhD, DABR

President & CEO of Advanced Radiation Physics Inc.

Affiliate Research Professor, Florida Atlantic University