PHYS 4814 Contemporary Applications of Physics: Medical Physics

Fall semester 2024

Lecture Wed 4:30 - 5:50 PM Room 1409
Fri 4:30 - 5:50 PM Room 1409

Instructor: Professor Hyokeun Park (Department of Physics and Division of Life science)
Office: Room 5452
Email address: hkpark@ust.hk
Telephone: 2358-7322

TA: Chu Pui Wu
Email address: cpwu@connect.ust.hk

Course Objective:
Introduces the concepts and practical applications of medical physics, including radiation physics, nuclear medicines such as radiotherapy, medical imaging including X-ray, nuclear medicine imaging, magnetic resonance imaging and ultrasound imaging.

Learning Outcomes:
1. Understand the basic concepts of medical physics and how these are related to our daily life.
2. Recognize how medical physics can contribute to treat human diseases.
3. Examine information relevant to medical physics issues.
4. Explain issues and importance of medical physics to general public.
5.

Syllabus:
1. Overview of Medical Physics
2. Medical Imaging Physics
3. Radiation Physics
4. Nuclear Medicine Physics
5. Medical Device

No textbook but **lecture notes** will be provided in
https://canvas.ust.hk/courses/45457/files/folder/Lecture%20notes

Main References:
Radiation Physics for Medical Physicists - by Ervin B. Podgorsak
The Fourier Transform & Its Applications 3rd Edition - by R. Bracewell
The Essential Physics of Medical Imaging - by J.T. Bushberg et al., Lippincott Williams & Wilkins

Medical Imaging Systems - By A. Macovski, Prentice-Hall
Physics in Nuclear Medicine - by S. Cherry, J. Sorenson, M. Phelps
Radiation detection and measurement - by Glen F. Knoll
Fundamentals of Ionizing Radiation Dosimetry - by Pedro Andreo, David T. Burns, Alan E. Nahum, Jan Seuntjens, Frank Herbert Attix
Radiation oncology physics: A handbook for teachers and students - by Ervin B. Podgorsak
The Physics of Radiotherapy - by Faiz M. Khan

Grading:
Homework: 50%
Final exam: 50%

Homework:
Homework assignments will be posted on Canvas on Nov 22. Please turn in your assignment to the TA before Dec 6.

Participation:
Participation is an important part of the learning process. We strongly recommend that students should participate in the class.