Department of Physics

College of Education

University of Salahaddin

Subject: Medical Physics

Course Book: First and Second course - 4 Stage

Lecturer's name:

Dr Haidar J. Ismail

Academic Year: 2023-2024

Course Book

1. Course name	**Medical Physics**
2. Lecturer in charge	**Dr Haidar J. Ismail**
3. Department/ College	**Physics/ Education**
4. Contact	**e-mail: haidar.ismail@su.edu.krd**
5. Time (in hours) per week	**2 hrs./weak**
6. Office hours	Thursday: 8:30-11:30 Am.
7. Course code	
8. Teacher's academic profile	In 1994, I graduated from the Education Coll./Physics dept. and got the MSc in the same university and department in 2003. My Ph.D. was from Pharmacology & Biophysics dept./ Medicine Coll./Hawler Medical University in 2012. I taught at nearly all labs., of the physics department. I have lectured on advanced electricity and magnetism, medical imaging, image processing, Fluid dynamics, thermodynamics, and programming (MATLAB).
9. Keywords	

10. Course overview:

Medical Physics is the application of physics to medicine. It uses physics concepts and procedures in the prevention, diagnosis, and treatment of disease. There are two important areas of medical physics: Physics of Physiology Contains the application of physics to the function of human bodies in health and diseases (eyes, ears, lungs, heart, circulatory system), the Application of physics principles in the practice of medicine (mechanics, heat, light, ultrasound, electricity magnetism, lasers, radiations). Modern medicine is underpinned by technological developments, many of which have their root in fundamental physics. This course will provide an introduction to the rich field of medical physics. The course will begin by outlining the mechanisms of particle interactions in matter and biological tissue, as well as methods employed to monitor and measure radiation. The methods and signal processing techniques employed in magnetic resonance imaging (MRI), positron emission tomography (PET) imaging, single photon emitting computed tomography (SPECT) imaging, and ultrasound will be discussed.

11. Course objective:

This course is aimed: At developing a basic understanding of medical physics concepts, developing problem-solving and critical-thinking skills, and learning to integrate and apply various physics concepts to a single problem.

12. Student's obligation

In the hall, the lecture will be illustrated through ordinary methods (PPT, white, and blackboards, to prepare them for monthly examinations.

13. Forms of teaching

Lectures will be through using ppt slides that are displayed on data-show, and black and white boards.

14. Assessment scheme

The final degree will form from:

1. Mid. Exam. 2. Seminars 3. H.W.

15. Student learning outcome:

After successful completion of the courses, the students learn:

- Fundamental knowledge of medical physics
- Fundamental technical knowledge of radiation safety.
- Knowledge to communicate the physical principles behind medical technology, radiation safety, and relevant applications.
- Knowledge of the normal structure and function of the body and its major organ systems applicable to clinical diagnostic imaging.

16. Course Reading List and References:

- Medical Physics, by John R. Cameron, 1978.
- Physics of the Human Body, Irving P. Herman, 2007.
- Different Internet sources.

17. The Topics:	**Lecturer's name**
1 Introduction 2 Force on and in the body 3 Physics of the Skeleton 4 Heat and cold in medicine 5 Energy, Work, and Power of the Body 6 Pressure in the body 7 The Physics of the Lungs 8 Physics of the Cardiovascular 9 System Electricity in the human body 10 Sound in medicine 11 Physics of hearing and ear 12 Light in medicine 13 Physics of eye and vision 14 x-rays in medicine 15 Nuclear medicine	Dr. Haidar J. Ismail
18. Practical Topics (If there is any)	

19. Examinations:

1. Compositional 2. True or false type of exams 3. Multiple choices

20. Extra notes:

21. Peer review **پێداچوونەوەی هاوەڵ**