

Ministry of Higher Education and Scientific research



**Department of Physics**

**College of Science**

**University of Salahaddin**

**Subject: *Medical Physics-First Semester***

**Course Book – (3<sup>rd</sup> Year - Medical)**

**Lecturer's name: *Dr. Dilshad Salih Ismael***

**Academic Year: 2022/2023**

# Course Book

<b>1. Course name</b>	Medical Physics
<b>2. Lecturer in charge</b>	<i>Dr. Dilshad Salih Ismael</i>
<b>3. Department/ College</b>	Physics/ Science
<b>4. Contact</b>	<a href="mailto:dilshad.ismael@su.edu.krd">dilshad.ismael@su.edu.krd</a>
<b>5. Time (in hours) per week</b>	<b>Theory: 3</b> <b>Practical: 0</b>
<b>6. Office hours</b>	<b>4</b>
<b>7. Course code</b>	
<b>8. Teacher's academic profile</b>	<p>I have more than 15 year experience teaching of different subjects such as: Classical Mechanic, Calculus, Electrical measurements, Electromagnetic Theory , Solid State Physics Lab., Electronics Lab. and General Physics Lab also I have four(2) papers are published in different foreign journals.</p> <p>B.Sc. of Physics from 2001 M.Sc. of Plasma Physics from 2005 Ph.D. of medical physics from 2015</p> <p>Assist Lecturer Oct 2005 – Feb 2015 Instructor Feb 2015 – up to date Assist Prof. ....</p>
<b>9. Keywords</b>	concepts in physics to living systems
<b>10. Course overview:</b>	<p>The aim of this course is to relate some of the concepts in physics to living systems. In general, the text follows topics found in medical physics texts. The discussion is organized into the following areas: physics of skeleton, heat and cold in medicine, the physics of the lungs and breathing, physics of the cardiovascular system, electricity within the body, physics of the ear and hearing, physics of eyes and vision. The course designed for B.Sc. student's medical branch of Department physics/ college of science /Salahaddin University.</p> <p>validity of the postulates upon which the theory is built.</p>
<b>11. Course objective:</b>	<p>The aim of this course is to relate some of the concepts in physics to living systems.</p>
<b>12. Student's obligation</b>	

The students are required to take two or three exams during the period of the course. 35 marks will be assigned to these exams. 5 marks will be assigned to the assignments given at the end of each chapter(including quizzes) and activities in the class room. There will be a final exam on sixty marks.

لیره ماموستا بهر پرسیاریتی قوتابی خویندکار رووندکاتوه سهبارت به کورسهکه بو نمونه نامادهبوونی قوتابیان له وانهکاندا، له تاقیکردنهکاندا، راپورت و ووتار نووسین... هتد.

### 13. Forms of teaching

Our lecture is depend directly on showing the strong point in the lecture via data show depending on the power point program... and solve problem on the white board with the students.

لیره ماموستا ریگهی وانه ووتنهوه دنوووسیت، بو نمونه: داتاشو و پاوه رپوینت، سهه تهخته رمش، تهخته ی سپی، سمارتپورد یان مهلهمه... هتد

### 14. Assessment scheme

The students are required to take two or three exams during the period of the course. 35 marks will be assigned to these exams. 5 marks will be assigned to the assignments given at the end of each chapter(including quizzes) and activities in the class room. There will be a final exam on sixty marks.

لیره ماموستا جوری ههلسنگاندن (تاقیکردنهکان یان نهزمونهکان) دنوووسیت بو نمونه تاقیکردنهوه مانگانه، کویزهکان، بیرکردنهوه ریخنهگرانه (پریزمنتهیشن)، راپورت نووسین، ووتار نووسین یان نامادهبوونی خویندکار له پوئادا... هتد. نامانه چهند نمره له سهه دهییت و ماموستا چون نمرهکان دابه شهکات؟

### 15. Student learning outcome:

پرکردنهوه ی نهه خانیه زور گرنگه، ماموستا دهه نهجمهکانی فیریبون دنوووسیت. بو نمونه: روونی نامانجه سهه کیهکانی کورسهکه (بابهتهکه) بو خویندکار گونجاندنی ناوه روکی کورسهکه به پیویستی دهه وه و بازاری کار قوتابی چی نوئ فیردهییت له ریگهی پیدانی نهه کورسهوه؟

This should not be less than 100 words

### 16. Course Reading List and References:

**Medical Physics** By John R. Cameron and James G. Skofronick

- Key references:
- Useful references:
- Magazines and review (internet):

### 17. The Topics:

Lecturer's name

<p><b>CHAPTER 1: Medical physics (1week)</b></p> <ol style="list-style-type: none"> <li>1- What is medical physics?</li> <li>2- Terminology</li> <li>3- Modelling.</li> <li>4- Measurement</li> <li>5- physician decides</li> <li>6- Diagnostic errors</li> </ol> <p><b>Chapter 2 : Forces on and in the Body ( 1week)</b></p> <ol style="list-style-type: none"> <li>1- Types of Forces</li> <li>2- Gravitation and Electric forces</li> <li>3- Gravitational forces (GF)</li> <li>4- Some Effects of Gravitational Force on the Body</li> <li>5- Center Of Gravity (COG)</li> <li>6- Determination of Total Body COG</li> </ol> <p><b>Chapter 3: Forces on the Bone and Muscles College. ( 2weeks)</b></p> <ol style="list-style-type: none"> <li>1- Classification of Bones</li> <li>2- Structure of bone</li> <li>3- The Composition of Bone</li> <li>4- Bone cells</li> <li>5- The Spinal Column</li> <li>6- Connective Tissues</li> <li>7- Force on the Bone and type of fractures</li> <li>8- Force on the spinal vertebra</li> <li>9- Force on Hip and Knee joint</li> <li>10-Osteoporosis</li> <li>11-Plantar Fasciitis</li> <li>12-Measurement of Bone Mineral in the Body</li> </ol> <p><b>CHAPTER 4: Pressure in the Body (2 weeks)</b></p> <ol style="list-style-type: none"> <li>1- Measurement of pressure in the body</li> <li>2- Pressure inside the skull</li> <li>3- Detecting the hydrocephalus</li> <li>4- Pressure in the Eye</li> <li>5- Pressure in the Digestive System</li> <li>6- Pressure (Stress) in the Skeleton</li> <li>7- Pressure in the Urinary Bladder</li> <li>8- Pressure Effect While Diving</li> <li>9- Hyperbaric oxygen therapy</li> </ol>	<p>Dr. Dilshad Salih Ismael ex: (3 hrs)</p>
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<p>Chapter 5: Physics of the Cardiovascular System. (2weeks)</p> <ol style="list-style-type: none"> <li>1- Components of the cardiovascular system</li> <li>2- Blood components</li> <li>3- O<sub>2</sub> and CO<sub>2</sub> exchange in the capillary system</li> <li>4- Work done by the heart</li> <li>5- Pressure across the blood vessel wall (Transmural Pressure)</li> <li>6- Bernoulli's principle applied to the cardiovascular system</li> <li>7- Blood flow-laminar and turbulent</li> <li>8- Heart sounds</li> <li>9- The physics of some cardiovascular diseases</li> <li>10- The functions of the blood</li> </ol> <p>Chapter 6: Sound in Medicine (1week)</p> <ol style="list-style-type: none"> <li>1- The Intensity of a Sound Wave</li> <li>2- The Acoustic Impedance (Z)</li> <li>3- Sound/Ultrasound Wave Reflection, Transmission and Absorption</li> <li>4- Percussion in Medicine</li> <li>5- The Stethoscope</li> <li>6- The Ultrasound</li> <li>7- Ultrasound Transducer Types</li> <li>8- Ultrasound Picture of the Body</li> <li>9- Type of Ultrasound Mode</li> <li>10- Doppler Technique</li> </ol>	
<p><b>18. Practical Topics (If there is any)</b></p>	
<p>In this section The lecturer shall write titles of all practical topics he/she is going to give during the term. This also includes a brief description of the objectives of each topic, date and time of the lecture</p>	<p>Lecturer's name ex: (3-4 hrs)</p>
<p><b>20. Extra notes:</b> Here the lecturer shall write any note or comment that is not covered in this template and he/she wishes to enrich the course book with his/her valuable remarks.</p>	
<p><b>21. Peer review</b> <span style="float: right;">پیداچونہوہی ھاوہل</span></p> <p>This course book has to be reviewed and signed by a peer. The peer approves the contents of your course book by writing few sentences in this section. (A peer is person who has enough knowledge about the subject you are teaching, he/she has to be a professor, assistant professor, a lecturer or an expert in the field of your subject).</p> <p>نہم کورسبووکہ دہییت لہلایہن ھاوہلئیکی ئەکادیمیہوہ سەیر بکرنیت و ناوہرۆکی بابەتەکانی کۆرسەکە پەسەند بکات و جەند ووشەبەک بنووسنیت لەسەر شیاوی ناوہرۆکی کۆرسەکە و واژووی لەسەر بکات. ھاوہل ئەو کەسەبە کە زانیاری ھەبیت لەسەر کۆرسەکە و دہییت پلەہی زانستی لہ مامۆستا کەمتر نەبیت.</p>	

