

1. Medical Physics

| Lec. | Subject | hours |
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| 1. | Diagnostics of X-ray (X-ray's production, Attenuation of X-rays, Interaction of X-ray with matter, Film, Factors Affecting the image quality, Computerized Axial Tomography, Magnetic Resonance imaging (MRI)) | 6 |
| 2. | Physics of Nuclear Medicine (Radioisotopes in Medicine) (None Stable elements (radioactive), Decay "Transformation" Process, Basic instrumentation and it's clinical Application, Sources of Radioactivity for nuclear Medicine) | 6 |
| 3. | Physics of Radiation Therapy (Principles of radiation therapy, Factors affecting radio sensitivity, Interaction of Radiation with the Biological Target) | 6 |
| 4. | Radiation protection (Natural Radiation, Artificial Radiation, Biological Effect of Ionizing Radiation) | 2 |
| 5. | Physics of the skeleton (Bones (Function of bones, Composition of bone and bone remodeling), Compact and trabecular bone, Stress-strain curve (Compressive and tensile stress, young modulus), Bone joints (synovial fluid, coefficient of friction of a joint)) | 4 |
| 6. | Heat and cold in medicine (Temperature scales, thermography, cold in medicine and cryosurgery) | 4 |
| 7. | Energy, Work and Power of the body (First law of thermodynamic, Energy change in the body (Met, Basal metabolic rate (BMR), Work and power, Efficiency heat losses from the body, Heat lost by (radiation, convection, evaporation of sweat and respiration)) | 4 |
| 8. | Pressure (Definition, absolute pressure, gauge pressure, negative pressure, unit of pressure, Measurement of pressure in the body (Manometer), Pressure inside skull, Eye pressure, Pressure in the skeleton, Pressure in the urinary bladder) | 4 |
| 9. | Sound in medicine (Properties of sounds, Ultrasound (A-scan, B-scan, M-scan and Doppler effect)) | 4 |
| 10. | Light in medicine (Properties of light, Applications of visible light in medicine (endoscope), Applications of ultraviolet and infrared light in medicine, Laser in medicine, Applications of microscopes in medicine) | 4 |
| 11. | Electricity within the body (Electrical potential of nerves (resting potential, action potential in myelinated and unmyelinated nerves), Electromyogram (EMG), Electrical potential in the heart (electrocardiogram ECG), Electroencephalogram (EEG), Application of electricity (macro and micro electrical shock, high frequency electricity) | 4 |

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| | in medicine) Short wave diathermy (capacitance and inductance method), Microwave diathermy) | |
| 12. | The Physics of Lungs and Breathing (Function of breathing system, The airways (the alveoli, the function of airways), Gases exchange in the lungs (ventilation, perfusion), Measurement of lung volumes (spirometer), Pressure airflow volume relationship of the lungs, Compliance, Surface tension (physics of alveoli, Laplace law)) | 4 |
| 13. | Cardiovascular instrumentations (Work done by the heart, Blood pressure and its measurement (indirect measurement, sphygmomanometer), Pressure across the blood vessel wall (Laplace wall), Bernoulli's principle applied to the cardiovascular system, Poiseuille's equation, laminar and turbulent flow, viscosity, Reynolds number, Physics of cardiovascular diseases) | 4 |
| 14. | Physics of ear and hearing, Structure of the ear (outer ear, middle ear and inner ear), Sensitivity of the ears | 4 |