| Phys 4607 | MEDICAL PHYSICS | (CR3) |
|---|---|---|
| Preq. | Phys 3402, 3702/ ADP (Physics) | |

**Objective**

*To give an introduction to various applications of physics in medical sciences and heatj care sector.*

**Syllabus**

Interactions of lonising Radiation with Matter: Introduction; Beta-rays, range-energy relationship, mechanism of energy loos, lonization and excitation, Bremsstrahlung, Alpha-rays, Rang-energy relation – ship, Energy transfer, Gamma-rays, exponential absorption, interaction mechanisms, Pair production,

Compton scattering, photoelectric absorption, photodisintegration, Combined effect, Neutrons, Production classification, interaction, Scattering, Absorption. Radiotherapy, development of radiotherapy, Radiotherapeutic aims, External beam therapy, Brachytherapy, Unsealed source therapy, Requirements for accuracy and precision, Quality assurance, The role of medical physics. Medical Imaging, Diagnostic X-rays, Production of X-rays, Absorption of x-ray to other planes, Partial volume effect, Artifacts, Contrast agents in conventional radiography and CT, Diagnostic Ultrasound, Doppler effect, Radionuclide imaging, positron emission tomography (PET), Magnetic resonance imaging (MRI), Contrast agents for MRI.

***Recommended Books***

1. *Introduction to Health Physics by H. Cember. 3rd Ed. McGraw Hill, (1996).*
2. *Diagnostic Imaging, by Peter Armstrong and Martin L. 4th Ed., Blackwell, (1998).*
3. *Radiologic Science of Technologists by S. C. Bushong, 5th Ed. Mosby, (1993).*
4. *Fundamentals of Radiation Dosimetry, by J. R. Greening, 2nd Ed. Adam Hilger, (1985).*
5. *Radiation Detection and Measurement, by Knol G.F., 2nd Ed. Willey, (1980).*
6. *Physics of Medical Imaging, by Edwin G. A. Aird, Heinemann, (1988).*