WAVOO WAJEEHA WOMEN'S COLLEGE
OF ARTS & SCIENCE - KAYALPATNAM
(Affiliated to Manonmanium Sundaranar University, Tirunelveli)
Run by : Wavoo SAR Educational Trust
(minority institution)

Course Title: **Instrumentation and Medical Physics** **Department : Physics** **Total Hours : 30 Hours** **Credit: 2**		
Course Pre-requisites/ Co-requisites	Basic knowledge in measurements and ideas about Medical Physics	
Objectives:	1. To recall and recognize the units of Physical quantities 2. To understand the different types of errors. 3. To Identify the sources of radio activity and radiation Safety 4. To generalize the uses of lasers and to Interpret the effect of laser radiation on tissues	
Expected Learning Outcome:	On completion of the course, students will have the ability to 1. define the physical quantities. 2. understand how to minimize instrumental errors. 3. know the radiation safety and the measurement of biological damage. 4. utilize the Medical Instrument facilities to improve their health condition.	
Unit.I	**Measurement**	**6 Hours**
Definition- units of measurement; Systems of units-length, mass and time measurements-accuracy and precision- Significant figures		
Unit. II	**Error**	**6 Hours**
Definition- Types of error- Statistical analysis (Arithmetic mean, deviation from the mean, average deviation, standard deviation)-probability of errors (Normal distribution of errors, probable error) – Limiting errors		
Unit.III	**BioMedical Instrumentation**	**6 Hours**
Angiography- Digital thermometer- Endoscopes-EEG,ECG- Computed Tomography (CT scan), X-ray machine, Cryogenic surgery MRI		

Unit.IV	Lasers in Medicine	6 Hours
Introduction- principle and production of laser- effects of radiation on tissues-Laser applications in therapy and diagnosis-Opthamology-Laser as a beautician's tool-biological effects		
Unit.V	**Radiation and Health Physics**	**6 Hours**
Artificial and natural radioactivity-Physical features of radiation- Units of radiation-Interaction of different types of radiation with matter-Effect of radiation on cells- measurement of biological damage-Linear energy transfer (LET) – radiation dosimetry		

Books for Study and Reference

1. Albert D. Helfrick and William D. Cooper, Modern Electronic Instrumentation and Measurement Techniques, prentice- Hall Of India Pvt,Limited, Reprint 2002.
2. 2. M. Arumugam, Biomedical instrumentation, Anuradha Agencies, Reprint 2002.
3. H.S. kalsi, Electronic instrumentation, Tata Mcgraw Hill Education Pvt. Limited, Reprint 2012.
4. Lasers in Medicine- RW Wayanant, Plenum publishing Co.
5. Basic radiological physics Dr. k. thayalan- Jayapee Brothers Medical publishing Pvt. Ltd. New Delhi (2003).

Mode of Evaluation	**Practice Tests-40%,Continuous Assessment Tests-60%,** Assessment Test-1 20% Assessment Test-2 20% Assessment Test-3 20%
Course Coordinator	Mrs. S.Pushpa, Assistant Professor & Head, Department of Physics
Course Instructors	Mrs. S. Pushpa, Head & Assistant Professor in Physics, Mrs. S. Jessie Jancy Rani, Assistant Professor in Physics, Miss. A.Jai Nirmala, Assistant Professor in Physics