No	Information of Radiation Spectrometry and Counting Statistics	
1	Unit name:	Radiation Spectrometry and Counting Statics
2	Code:	NE 51034
3	Classification:	Major
4	Credit value:	2.5
5	Semester/ Year Offered:	1/5
6	Pre-requisite:	Successfully taken course in properties of radiation and radioactivity ,basic principle of gas filled detector, scintillation detectors and semiconductor detectors
7	Mode of delivery:	Regular lectures, PPT presentation
8	Assessment system and breakdown of marks:	Assignment, class activity, presentation, project
	Class Activity and Presentation	20%
	Assignment/Home work	10%
	Q & A	70%
9	Academic staff teaching unit:	Department of Nuclear Technology
10	Course outcome of unit: After completion of this course, students will be able to 1. Analyzes the results obtained from experiments and determine the statistical errors of radiation measurements. 2. Analyzes measured energy spectrum for determination of energy resolution, efficiency and calibration of a multichannel analyzer in spectroscopic measurements. 3. Identify the energy deposition in the detector for X-ray and Gamma ray with different types of detection system of scintillation detectors, proportional counter, semiconductor detectors and crystal spectrometer. 4. Comprehend basic principle of charged particle spectroscopy system for measurement of electron, alpha, proton, deuteron and triton with different spectrometers. 5. Explain the neutron detection and spectroscopy with different measurement methods and neutron measurement systems.	

	6. To identify and address seek their educational needs (life-long learning)
11	Synopsis of unit: The subject of the course covered the error analysis of the radiation detection and measurements, radiation spectroscopy system with photon (gamma and X-ray), charged particle spectroscopy system and neutron detection and spectroscopy systems. Error analysis of experimental results for determination of statistical error, standard deviation and error propagations and error reduction are studied for practical radiation counting measurements. Basic principles gamma photon energy deposition in the different types of detection systems: scintillation detectors, semiconductor detectors are studied for practical gamma spectroscopic measurements. The spectrum analysis for the determination of resolution, efficiency and calibration of the measurement system are studied. The charged particle spectroscopic measurements for different charge particles with various spectrometers are studied. The neutron detection for different neutron energy ranges according to foil activation ,proton recoil method, threshold activation method , time of flight methods are studied.
12	Topic: 1. Errors of Radiation Counting 2. Introduction to Spectroscopy 3. Photon(gamma ray and X-ray)Spectroscopy 4. Charged Particle Spectroscopy 5. Neutron Detection and Spectroscopy
14	Main references: Nicholas Tsoulfanidis and Sheldon Landsberger ,4th Edition, Measurement and Detection of Radiation by Taylor & Francis Group,2015 (Internet Downloadable)
15	Additional references: Knoll, G. F., Radiation Detection and Measurement, 4th ed. Wiley, New York, 2010.

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