No	Information of Introduction to X- ray Spectroscopy	
1	Unit name	Introduction to X-ray spectroscopy
2	Code	NE 51035
3	Classification	Major Subject
4	Credit value	3
5	Semester / year Offered	1/6
6	Pre-requisite	NA
7	Mode of delivery	Text
8	Assessment system and breakdown of marks	Tutorial, Assignment, Exam
	Assignment	5%
	Tutorial	10%
	Exam	35%
9	Academic staff teaching unit	Department of Nuclear Technology
10	Course outcome of unit	After teaching of this course, students will be able to 1. Explain the principle of interaction of x-rays with matter 2. Discuss about characteristics of most important x-ray sources 3. Understand the operation of main optical elements and detectors for x-rays. 4. Understand the principles of X-ray fluorescence and x-ray absorption spectroscopy, 5. Know the necessary experimental equipment, and understand basic methods for analysis and interpretation of measurement spectra, and understand what kind of structural information about the investigated material can be obtained by individual spectroscopic methods. 6. Understand the applications of the technique
11	Synopsis of unit	X-ray spectroscopy is an excellent method to determine the structure of compound. However, this technique requires the availability of a compound as a single crystal. X-ray spectroscopy is the method of choice for structural determination where the other parameters such as bond lengths and bond angles are also determined. The discovery of x- rays and the polarization and reflection experiments that demonstrated the wave nature of x-rays. The emission spectrum and the two principle mechanism for production of x-rays. Describe their three processes, photoelectric absorption, Compton scattering and pair production which show the nature of x-rays. Explain the absorption of x-ray in materials. Present an important practical applications of x-ray.
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14	Main references:	Gamma-and x-ray spectrometry with semiconductor dectors, 1988 Klaus Debertin and Richard G.Helmer
15	Additional references:	Modern Atomic and Nuclear Physics, Fujia yang and Joseph H. Hamalton, International Edition 1996

NE 51051- Introduction to X-ray Spectroscopy Course outcomes and Indicators

	Learning Outcomes	Learning Indicators
	1. Recognize the regions of electromagnetic spectrum and relate it to spectroscopic methods 2. Differentiate and understand the difference between atomic and molecular energy levels 3. Relate energy levels with absorption and emission in various regions of electromagnetic spectrum 4. Understand the basic principles of x-ray fluorescence 5. Recognize the components of instrumentation 6. Understand the applications of the technique	1. Exercises on software for the analysis of x-rays spectra under supervision of the course principal- 2. Individual analysis of x-rays spectra under supervision of the course principal 3. Presentation of the results of the analysis to other students in the group and open discussion about the analysis topic under supervision of the course principal