Course Type	Course Code	Name of Course	L	T	P	Credit
DC	GPC 208	Radiometric Methods Practical	0	0	2	2

Course Objective

The primary objective of this practical course is to make students familiar with problems of nuclear geophysics. The purpose of this course will be to understand and appreciate the symbiotic relationship that exists between mathematics and theoretical geophysics

Learning Outcomes

After the successful completion of this course, students can understand the raw radiometric data and calculate the age of the rock and radiometric parameters from the given data.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1.	Age determination using Rubidium-Strontium isotope data	**2**	Helps to understand the Rb-Sr data and determine the age of the rocks from the given data.
2.	Age determination using Uranium-Lead isotope data and interpretation of Concordia and Discordia curves	**2**	Helps to understand the U-Pb data and determine the age of the rocks from the given data.
3.	Age determination using Lead-Lead and Thorium-Lead isotope data	**2**	Helps to understand the Pb-Pb, and Th-Pb data to determine the age of the rocks from the given data.
4.	Age determination using Potassium-Argon and Argon-Argon isotope data	**4**	Helps to understand the K-Ar data to determine the age of the rocks from the given data.
5.	Determination of best operating voltage ($Vapp$) and breakdown (V2) voltage of the Geiger-Müller (GM) tube	**2**	Understanding the operation of GM counter
6.	Determination of the dead time of the GM tube using the two source technique.	**2**	Understanding the operation of GM counter
7.	Handling of Geiger-Müller (GM) counter, Field planning and acquisition of ground radiometric data in IIT-ISM campus	**4**	Hands-on experience in operating the GM counter for data acquisition
8.	Effective Sample Volume, and Counting Statistics of Radiation detectors	**2**	Understanding the measuring parameters of Radiometers
9.	Interpretation of Scintillometer data	**2**	Understanding the operation of SM counter

10.	Gamma-ray spectrometer calibration and stripping ratio.	**2**	Understanding the operation of Gamma-ray spectrometer
11.	Determine the true counts of Th, U, and K content from Gamma-ray spectrometer data.	**2**	Understanding the operation of Gamma-ray spectrometer
12.	Borehole radiometric data processing and estimation average grade of Uranium ore	**2**	Understanding the operation of Gamma-ray spectrometer
	Total Classes:	**28**	

Textbooks

- E. Rutherford, Radioactivity, Dover Publishers, 2004.
- C.G.Clayton, Nuclear Geophysics, Permagon, 1983.

Reference Books

- W.M. Telford, L.P.Geldart, and R.E.Sheriff, Applied geophysics,Cambridge,1990
- Lowrie, W., Fundamentals of Geophysics, Cambridge Univ. Press, 2007.
- Stanislav Mares, Introduction to applied geophysics, D.Reidel Publishing Co.,1984
- V.L.S.Bhimasankaram, N. Venkat Rao K. S. R. Murthy, and E.I. Savenko, Principles and Methods of Nuclear Geophysics, AEG Publication, 1985
- Stacey F. and Davis P., Physics of the Earth, Cambridge University Press, 2008.