Name of Programme: M. Sc. Applied Geology
Course Code: GEO-525
Title of the Course: Exploration Geophysics
No of Credits: 03
Effective from AY: 2022-23

Prerequisites for the course:	Degree of Bachelor of Science in Geology from any UGC recognized University or an equivalent examination.	
Objective:	The main objective of this course is to get students acquainted with applications of geophysics in geology.	
Content:	**Module 1:** Introduction to exploration geophysics: Introduction to electro-magnetic spectrum, usefulness of various methods, Electrical methods: instrumentation, field procedure and interpretation using electrical methods. Electrical profiling and sounding using Wenner and Schlumberger configurations. Principles and fundamental procedures of data collection and interpretation. **Module 2:** Seismic Methods: Principles, instrumentation, survey procedures and interpretation using seismic methods. Correction applied to seismic data. Geophysical well logging: Introduction well logging methods, porosity logs, well log interpretation. Latest methods from air-borne sources including drones and helicopters. **Module 3:** Gravity and magnetic methods: Principles-field methods-gravimeters-corrections, interpretation of gravity data. Principles, instrumentation, field procedures, data analysis and interpretation of magnetic data. Principles and field application of Ground Penetrating Radar (GPR) for sub-surface studies. Data analysis and interpretation.	15 hours 15 hours 15 hours
Pedagogy:	It is a theory component and entire course is taught in the class and various case studies for the application of different geophysical methods are discussed.	
References/Readings	1. Kearey, P., Brooks, M., and Hill, I. (2002). *An introduction to geophysical exploration* (Vol. 4). John Wiley and Sons. 2. Telford, W. M., Geldart, L. P., and Sheriff, R. E. (1990). *Applied geophysics*. Cambridge university press. 3. William, L. (1997). Fundamentals of geophysics. 4. Sharma, P. V. (1985). Geophysical methods in geology. 5. Dobrin, M. B., and Savit, C. H. (1960). *Introduction to geophysical prospecting* (Vol. 4). New York: McGraw-Hill.	

Course outcomes	1. Students will get knowledge about the physical properties of the Earth. 2. The students will learn various geophysical techniques. 3. They will learn to identify and choose the technique used for locating and exploiting resources like hydrocarbons, minerals and groundwater. 4. Upon completion of this course the student will learn to analyze and interpret geophysical data.	