

Name of Programme: M. Sc. Applied Geology

Course Code: GEO-627

Title of the Course: Soil Science

No of Credits: 03

Effective from AY: 2023-24

Prerequisites for the course	Students should have undergone M.Sc. Semester I and II.	
Objective	To make students understand soil properties, their applications as well as conservation and management.	
Content	Module 1 Introduction: Nature and importance of soil, soil formation, soil survey, physical, chemical and biological characters of soil. Relationship between soil, plants and animals. Soil types: Soil types and classification, soil genesis, mineralogy and geochemistry of soil types: laterites, bauxites, ardisols, vertisols, camborthids. Application of soil micromorphology and landscape evolution. Radiometric age determination of soils.	15 hours
	Module 2 Soil and crop production: Elements essential for plants and animals, soil nutrients, nitrogen, phosphorous, potassium, calcium, magnesium, and sulphur in soil and their significance in plant growth, micronutrients; Soil quality and landscape: Soil and water relation, organic matter in soil, functions of organic matter, organic matter and soil structure, organic matter and essential elements, tillage, cropping systems and fertility and case studies.	15 hours
	Module 3 Soil contamination and desertification. Soil management and conservation: Introduction, irrigation, drainage, soil management for field crops, gardens, lawns, pastures, rangelands and forests. Conservation factors and implementation methods.	15 hours
Pedagogy	Lectures, Case studies, Discussions and Assignments.	
References/ Readings	<ol style="list-style-type: none">1. Brady, N. C., & Weil, R. R. (2002). The nature and properties of soils 13th ed Prentice Hall. <i>New Jersey, USA</i>, 249.2. Sparks, D. L. (2019). Fundamentals of soil chemistry. <i>Encyclopedia of Water: Science, Technology, and Society</i>, 1-11.3. Raymond, B. D., & Richard, D. (2000). <i>Soil geomorphology</i>, John Wiley & Sons, 2000.4. Summer, M. E. (1995). Hand Book of Soil Science. University of Georgia.5. Sparks, D. L. (2003). <i>Environmental soil chemistry</i>. Elsevier.	
Course outcomes	<ol style="list-style-type: none">1. Students will able to get an understanding of the relationship between soil, animals and plants.2. They will get an understanding of soils and their classification and manage the utility of soils.3. Students will also learn about soil management and conservation.	