

Course title: Soil Science				
Course code: NRE 130		No. of credits: 3	L-T-P: 25-12-10	Learning hours: 42
Pre-requisite course code and title (if any):				
Department: Energy and Environment				
Course coordinator: Ms Ranjana Ray Chaudhuri			Course instructor: Ms Ranjana Ray Chaudhuri	
Contact details: ranjana.chaudhuri@terisas.ac.in				
Course type: Elective			Course offered in: Semester 2	
Course Description The course will help students to understand soil's physical attributes, biological composition and chemical makeup. This knowledge will help them to solve range of soil management issues. The course will equip students to conservationist to replenish degraded ecosystem.				
Course objective				
<ul style="list-style-type: none"> To provide skillsets related to monitoring the properties of soil Imparting knowledge related to agriculture management techniques and conservation of natural resources 				
Course content				
Module	Topic	L	T	P
1.	Soil physical and chemical properties: soil formation and distribution; mobility of nutrient and trace elements during soil genesis; paedogenic evolution and inherent soil fertility	5	4	
2.	Soil biology and biochemistry: fundamental biological and biochemical features and processes occurring in soil systems	5	4	
3.	Soil erosion and conservation: soil erosion and effects of modern agriculture on soil geochemistry, introduction to different conservation and soil remediation practices	10		
4.	Soil pollution: Interactions between industrial effluents and soils; soil contamination with radionuclides.	5	4	
5	Practical's: <ul style="list-style-type: none"> Determination of soil colour by Munsell soil colour chart in field Determination of bulk density (clod coating method) and particle density by pycnometer method and porosity of soil Determination of soil texture by feel method and sieve analysis Determination of soil texture by Bouyoucos hydrometer method Determination of infiltration rate of soil by double ring infiltrometer Determination of pH, conductivity and anion/cation exchange capacity of soil Study of soil map 			10
		25	12	10
Evaluation criteria				
<ul style="list-style-type: none"> Test 1: 30% Test 2: 30% Test 3: 40% Practical 				
Learning outcomes				
Physico-chemical, mineralogical and biological properties of soil (Test 1 and Test 3)				
Understanding of soil remediation techniques and basic principles involved (Test 2)				
Biological processes occurring in soil (Test 2 and Test 3)				
Pedagogical approach				
Classroom lectures, tutorials and practical				
Materials & Required text				

Fundamentals of Soil Science, 8ed by Henry D Foth, John Wiley
Fundamentals of Soil Science by Indian Society of Soil Science (ISSS)
Tan, K.H., 2009. *Environmental soil science*. CRC Press.
Rowell, D.L., 2014. *Soil science: Methods & applications*. Routledge.

Journals

Soil biology and biochemistry
Soil research
Journal of Soil and Water Conservation
Indian Journal of Soil Conservation
Soil biology and biochemistry
Soil research
Catena
Sedimentology
Journal of sedimentary research

Additional information (if any)

Student responsibilities

Meeting deadlines for assignment submissions, attending regular classes

Course Reviewers:

1. Dr. Anshumali, Associate Professor, Indian School of Mines, Department of Environmental Science and Engineering, Indian Institute of Technology (ISM) Dhanbad
2. Dr. Abhay Kumar Singh, Sr. Principal Scientist, Central Institute of Mining and Fuel Research, Dhanbad