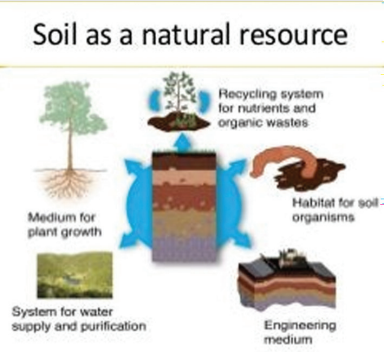

source: https://www.slideshare.net/bala1957/characteristics-of-soils

22BEAS113 PRINCIPLES OF SOIL SCIENCE

Hours Per Week :

L	T	P	C
2	0	2	3

PREREQUISITE KNOWLEDGE: Soil Physics, Soil Chemistry, Soil genesis and classification, Soil organic matter, Soil nutrient management and Soil reclamation.

COURSE DESCRIPTION AND OBJECTIVES:

The goal of this course is to build a grasp of the principles of soil science through Soil Physics, Soil Chemistry, Soil genesis and classification, Soil organic matter, Soil nutrient management and Soil reclamation that serves as an essential tool in several engineering applications.

MODULE-1

UNIT-1 **8L+0T+8P=16 Hours**

SOIL PHYSICS, SOIL GENESIS AND CLASSIFICATION & SOIL CHEMISTRY:

Nature and origin of soil; soil forming rocks and minerals, their classification and composition, soil forming processes, classification of soils – soil taxonomy orders.

Important soil physical properties and their importance; soil particle distribution; soil inorganic colloids – their composition, properties and origin of charge.

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UNIT-2 **08L+0T+8P=16Hours**

SOIL NUTRIENTS AND SOIL ORGANIC MATTER:

Ion exchange in soil and nutrient availability; soil organic matter – its composition and decomposition, effect on soil fertility; soil reaction – acidic, saline and sodic soils

PRACTICES:

- Identification of rocks and minerals.
- Examination of soil profile in the field.
- Collection of Soil Sample.
- Determination of bulk density.
- Determination of particle density and porosity of soil.
- Determination of organic carbon of soil.

MODULE-2

UNIT-1 **9L+6T+0P=15 Hours**

SOIL NUTRIENT MANAGEMENT:

Quality or irrigation water; Essential plants nutrients – their functions and deficiency symptoms in plants; Important inorganic fertilizers and their reactions in soils.

UNIT-2 **4L+8T+8P=20 Hours**

SOIL RECLAMATION:

Use of saline and sodic water for crop production, Gypsum requirement for reclamation of sodic soils and neutralising RSC; Liquid fertilisers and their solubility and compatibility.

PRACTICES:

- Determination of Nitrogen.
- Determination of Phosphorus.
- Determination of Potassium.
- Identification of nutrient deficiency symptoms of crops in the field.
- Determination of gypsum requirement of sodic soils.
- Determination of water quality parameters.

COURSE OUTCOMES:

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Apply their knowledge and acquired principles on cereals, pulses, oilseeds and commercial crops in agriculture for increasing yields and reducing cost of cultivation	Apply	1	1,5,6,7
2	Apply and develop new package of practices for various crops in agriculture, horticulture and sericulture	Apply	2	1,3,5,8,9
3	Analyze the problems faced by the farmers in agriculture in view of increasing yields and reducing cost of cultivation	Analyze	2	2,4,6,7
4	Evaluate the trend and current scenario of investments and returns on local and global agriculture	Evaluate	2	2,3,4,6

TEXT BOOKS:

1. Indian Society of Soil Science, “Fundamentals of Soil Science IARI” New Delhi, 1998.
2. Brady Nyle C and Ray R Well. “Nature and properties of soils” Pearson Education Inc., New Delhi,2008.
3. Sehgal J.. A. Textbook of Pedology Concepts and Applications. Kalyani Publishers, New Delhi, 2015.

REFERENCE BOOK:

1. Hillel D. “Introduction to Soil Physics” Academic Press, London, 2013.

SKILLS:

- ✓ *Determination of Organic carbon of soil.*
- ✓ *Determination of Nitrogen.*
- ✓ *Determination of Phosphorus.*
- ✓ *Determination of Potassium.*
- ✓ *Determination of Gypsum requirement of sodic soils.*
- ✓ *Determination of water quality parameters.*