

19AG102 PRINCIPLE OF SOIL SCIENCE

Hours Per Week :

L	T	P	C
2	0	2	3

Total Hours :

L	T	P	WA/RA	SSH/HSB	CS	SA	S	BS
30	-	30	10	45	-	-	-	-



Source :

https://www.sciencenewsforsstudents.org/sites/default/files/scald-image/860_main_questions_CJdirt_0.gif

COURSE DESCRIPTION AND OBJECTIVES:

Build fundamental knowledge and skills of the students within the different areas of soil science to enhance their professional skills. Familiarize the students with the origin of soil, different soil forming processes and different soil taxonomy orders. Identify and describe soil physical, chemical, and biological properties and processes that affect agricultural and non-agricultural land use and management.

COURSE OUTCOMES:

Upon completion of the course, student will able to achieve the following outcomes:

COs	Course Outcomes	POs
1	Understand the cropping patterns, package of practices and impact of weather and atmosphere on day to day agriculture	9
2	Apply their knowledge and acquired principles on cereals, pulses, oilseeds and commercial crops in agriculture for increasing yields and reducing cost of cultivation.	1
3	Analyse the problems faced by the farmers in agriculture in view of increasing yields and reducing cost of cultivation.	2
4	Evaluate the trend and current scenario of investments and returns on local and global agriculture.	4
5	Apply and develop new package of practices for various crops in agriculture, horticulture and sericulture.	1
6	Create and manifest the scientific aptitude and attitude of agronomy at individual capacity and also with a team work approach for overall development of farmers in Indian agriculture	3

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.

UNIT – I	L-06
Nature and origin of soil: Soil forming rocks and minerals, their classification and composition, soil forming processes.	
UNIT – II	L-06
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.	
UNIT – III	L-06
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.	
UNIT – IV	L-06
Quality or irrigation water: Essential plants nutrients – their functions and deficiency symptoms in plants; important inorganic fertilizers and their reactions in soils.	
UNIT – v	L-06
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.	

LABORATORY EXPERIMENTS

LIST OF EXPERIMENTS	TOTAL HOURS-30
1. Collection of Soil samples	
2. Identification of rocks & Minerals	
3. Determination of bulk density of soil by core sampler method	
4. Determination of particle density of soil	
5. Determination of organic carbon of soil	
6. Determination of Nitrogen in soil	
7. Determination of Phosphorous in soil	
8. Determination of Potassium in soil	
9. Identification of nutrient deficiency symptoms of crops in field	
10. Determination of gypsum requirement of Sodic or alkali soil	
11. Determination of pH and EC of irrigation water	
12. Determination of carbonates and bicarbonates in irrigation water	
13. Determination of chlorides in irrigation water	
14. Determination of calcium and magnesium content in irrigation water	
15. Determination of sodium and potassium content in irrigation water and computation of quality class, RSC and SAR of irrigation water	
16. Practical Exam	

TEXT BOOK :

1. Indian Society of Soil Science, 1998. Fundamentals of Soil Science. IARI, New Delhi.
2. Dilip Kumar Das, Introductory Soil Science, 2004, Kalyani publishers, New Delhi.

REFERENCE BOOKS :

1. Brady Nyle C. and Ray R. Well. 2002. Nature and properties of soil. Pearson Education Inc., New Delhi.
2. Tisdale, S.L. Nelson W.L., Beaton J.D. and Havlin. J.L. 199. Soil Fertilizers. Prentice Hall of India, New Delhi.
3. Hillel D. 1982. Introduction to Soil Physics. Academic Press, London.
4. HLS Tandon, 2006, Methods of Analysis of soils, plants, waters, fertilizers and organic manures, Fertilizer Development & Consultation Organisation, New Delhi.

