

INSTITUTE	FACULTY OF AGRICULTURE
PROGRAM	BACHELOR OF SCIENCE (Hons.) AGRICULTURE
SEMESTER	3
COURSE TITLE	PROBLEMATIC SOILS AND THEIR MANAGEMENT
COURSE CODE	16AS0302
COURSE CREDITS	3

Objective:

- 1 To identify the problem and what are the reclamation method requires improving the soil health.
- 2 To learn practically about the identification of problem soil.

Course Outcomes: After completion of this course, student will be able to:

- 1 Students will know about problematic soil of India and Gujarat.
- 2 Students will gain knowledge about management practices of different problematic soil.
- 3 Student will identify soil genesis of problematic soil.
- 4 Students will know area and distribution of problematic soil with their local problem solution.

Pre-requisite of course: To have basic knowledge about different types of soils and their management.

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
2	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	Soil quality and health, Distribution of Waste land and problematic soils in Gujarat and India and their categorization based on properties. Soil quality and health, Distribution of Waste land and problematic soils in Gujarat and India and their categorization based on properties.	1
2	Reclamation and management of Saline and sodic soils, Acid soils, Acid Sulphate soils, Eroded and Compacted soils, Flooded soils, Polluted soils. Reclamation and management of Saline and sodic soils, Acid soils, Acid Sulphate soils, Eroded and Compacted soils, Flooded soils, Polluted soils.	4

Contents : Unit	Topics	Contact Hours
3	Irrigation water – quality and standards, utilization of saline water in agriculture. Irrigation water – quality and standards, utilization of saline water in agriculture.	1
4	Remote sensing and GIS in diagnosis and management of problematic soils. Remote sensing and GIS in diagnosis and management of problematic soils.	2
5	Multipurpose tree species, bio remediation through MPTs of soils, land capability and classification, land suitability classification. Multipurpose tree species, bio remediation through MPTs of soils, land capability and classification, land suitability classification.	2
6	Problematic soils under different Agro-climatic zones of Gujarat. Problematic soils under different Agro-climatic zones of Gujarat.	1
Total Hours		11

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	Preparation of saturated paste of problematic soil Preparation of saturated paste of problematic soil	2
2	Determination of pHs and E_c of saturation extract of problematic soil Determination of pHs and E _c of saturation extract of problematic soil	2
3	Estimation of water soluble and exchangeable cations in soil and computation of SAR and ESP and characterization of problematic soil Estimation of water soluble and exchangeable cations in soil and computation of SAR and ESP and characterization of problematic soil	2
4	Determination of Gypsum requirement of alkali / sodic soil Determination of Gypsum requirement of alkali / sodic soil	2
5	Determination of lime requirement of acidic soil Determination of lime requirement of acidic soil	2
6	Determination of quality of irrigation water (pH, EC, Ca, Mg, Na, CO₃, HCO₃, Cl, SAR and RSC) Determination of quality of irrigation water (pH, EC, Ca, Mg, Na, CO ₃ , HCO ₃ , Cl, SAR and RSC)	2
Total Hours		12

Textbook :

- 1 Textbook of Soil Science, R. K. Mehra, ICAR, 2017

References:

- 1 Problematic soils and their management, Problematic soils and their management, D.K. Das, Kalyani Publishers, 2019
- 2 The Nature and Properties of Soil, The Nature and Properties of Soil, N.C. Brady, Macmillan Publishing Company, 1990
- 3 Alkali Soils their Reclamation and management, Alkali Soils their Reclamation and management, L.L. Somani, Divyajoyti Prakashan, 1990
- 4 Concept of Soil Science, Concept of Soil Science, S.G. Rajput, Kalyani Publishers, 2012

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking
25.00	25.00	20.00	10.00	10.00	10.00

Instructional Method:

- 1 The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board may also use any of tools such as demonstration, role play, quiz, brain storming, MOOCs etc.
- 2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- 3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
- 4 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory.