

Syllabus for B.Sc. (Hons) Agriculture Year – II (Sem. IV)

Subject Code: 16AS0413

Subject Short Name: Ag. Chem. 4.3

Subject Name: Problematic Soils and their Management

Objective:

1. To acquaint the students about various problem soils like degraded soils, acid soils, saline soils, alkali soils, eroded soils, submerged soils, polluted soils. Also to impart knowledge about remote sensing, GIS, Multipurpose tree and Land capability classification.
2. To give hands on training about estimation of various soil and water quality parameters associated with problem soils.

Credits Earned: 2 Credits (1+1)

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

- Know about problematic soil of India and Gujarat.
- Gain knowledge about management practices of different problematic soil.
- Identify soil genesis of problematic soil.
- Know area and distribution of problematic soil with their local problem solution.

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	Mid Sem (M)	Progressive Assessment (PA)	Viva (V)	Term work (TW)	
1	0	2	2	40	20	20	10	10	100

Theory Content:

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.	1
2	Reclamation and management of Saline and sodic soils, Acid soils, Acid	4

	Sulphate soils, Eroded and Compacted soils, Flooded soils, Polluted soils.	
3	Reclamation and management of Contaminated soils (Pesticide contamination, Heavy metal contamination), Mined soils (Coal mined, Oil mined), Management of Riverine soils, Waterlogged soils	3
4	Irrigation water – quality and standards, utilization of saline water in agriculture.	2
5	Remote sensing and GIS in diagnosis and management of problematic soils.	2
6	Multipurpose tree species, bio remediation through MPTs of soils, land capability and classification, land suitability classification.	2
	Total	14

Practical Content:

Unit	Topics	Contact Hours
1	Determination of pHs and E _c of saturation extract of problematic soil	2
2	Determination of redox potential in soil	2
3	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	2
5	Determination of lime requirement of acidic soil	2
6	Determination of quality of irrigation water (pH, EC, Ca, Mg, Na, CO ₃ , NO ₃ HCO ₃ , Cl, SAR and RSC)	2
7	Determination of dissolved oxygen and free carbon dioxide levels in water samples.	2
	Total	14

Reference Books:

1. Introductory soil science, Das P. K., Kalyani Publishers, New Delhi., 2015
2. Fundamentals of soil science, Patil V. D. and Mali C. V., Phoenix publishers, Parbhani, 1999
3. Fundamentals of soil, Sahai V. N., Kalyani Publishers, New Delhi, 1990
4. The nature and properties of soil, Brady N. C. and Well R. R., Pearson education, 2008
5. Fundamentals of Soil Science, Indian Society of Soil Science (ISSS), Indian Society of Soil Science, New Delhi, 2012

Suggested Theory distribution:

The suggested theory distribution as per Bloom’s taxonomy is as per 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	Understand	Apply	Analyze	Evaluate	Create
25%	25%	20%	10%	10%	10%

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 white 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 class-rooms.
3. Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory/ field.
4. Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory.