

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

Subject Code: 16AS1202

Subject Short Name: Ag. Chem. 2.2

Subject Name: Soil Fertility Management

Objective:

- To provide a comprehensive knowledge of soil fertility, plant nutrition, fertilizers, and nutrient management.

Credits Earned: 3 Credits (2+1)

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

- Know the requirements of manures and fertilizers for various crops and their proper time of application.
- Know how the soil fertility and productivity can be maintained for better crop production.
- Know the management of different types of soil.
- Know the application of different fertilizer on different season.

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)	
2	0	2	3	40	20	20	10	10	100

Theory Content:

Unit	Topics	Contact Hours
1	History of soil fertility and plant nutrition. Criteria of essentiality	2
2	Role, deficiency and toxicity symptoms of essential plant nutrients. Critical levels of different nutrients in soil	2
3	Integrated nutrient management	2

	Mechanisms of nutrient transport to plants, factors affecting nutrient availability to plants.	
4	Chemistry of soil nitrogen, phosphorus, potassium, calcium, magnesium, sulphur and micronutrients.	2
5	Introduction and importance of manures and fertilizers	2
6	Preparation and properties of major manures (FYM, Compost, Vermicompost, Green manuring, Oilcakes).	2
7	Chemical fertilizers: classification, composition and properties of major nitrogenous, phosphatic, potassic fertilizers, secondary and micronutrient fertilizers, complex fertilizers, nano fertilizers.	2
8	Soil amendments, fertilizer storage and fertilizer control order	2
9	Soil fertility evaluation and soil testing	1
10	STCR/RTNM/ IPNS, Carbon sequestration and Carbon Trading	2
11	Forms of nutrients in soil, plant analysis, and rapid plant tissue tests. Indicator plants.	2
12	Methods of fertilizer recommendations to crops	1
13	Factors influencing nutrient use efficiency (NUE), methods of application under rainfed and irrigated conditions	2
	Total	24

Practical Content:

Unit	Topics	Contact Hours
1	Introduction of analytical instruments and their principles, calibration and applications of Colorimetric and flame photometry	2
2	Estimation of alkaline hydrolysable N in soils	2
3	Estimation of soil extractable P in soils	2
4	Estimation of exchangeable K in soils	2

5	Estimation of exchangeable Ca and Mg in soils	2
6	Estimation of soil extractable S in soils	2
7	Estimation of DTPA extractable Zn in soils	2
8	Estimation of N, P, K and S from plant	2
	Total	16

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.