



AMITY UNIVERSITY
 ——— UTTAR PRADESH ———

FORMAT FOR COURSE CURRICULUM

Course Title: ADAVANCES IN SOIL FERTILITY MANAGEMENT

Course Level:PG Course Code: AGRI610

Credit Units: 4

L	T	P/S	SW/FW	No. of PSDA	TOTAL CREDIT UNITS
2	-	2	2	4	4

Course Objectives:

The objective of the course is to familiarize students about the basic concepts of soil fertility, techniques of evaluation of soil fertility and plant nutrients and knowledge of integrated approach for the plant nutrition and nutrient management.

Pre-requisites:

Basic Understanding and knowledge of concepts of soil fertility and plant nutrition

Course Contents/Syllabus:

	Weightage (%)
Module I Introduction	15%
Descriptors/Topics Historical aspects of soil fertility, essential plant nutrients: criteria of essentiality, classification, functions, deficiency and toxicity symptoms, beneficial elements. Carbon cycle in nature, carbon stocks, sequestration, greenhouse effects, different carbon pools in soil and their role in maintaining soil quality and productivity.	

Module II Nutrient Dynamics	30%
<p>Descriptors/Topics</p> <p>Transformations and dynamics of major- and micro-nutrients in soils and their availability to plants. Nutrient interactions in soils and plants: concept, different types of interaction, interaction among essential plant nutrients, law of minimum and maximum; soil organisms and their role in soil fertility.</p>	
Module III Soil Fertility Evaluation and Fertilizer Recommendations	35%
<p>Descriptors/Topics</p> <p>Commercial fertilizers, new fertilizer materials and principles of their evaluation, crop response to fertilizer application and use efficiency, economics of fertilizer use, nutrient requirements of crops and cropping systems in sustainable agriculture and quality of the produce, foliar nutrition of crop plants. Soil fertility evaluation: different approaches, soil and plant tests, biological tests, hidden hunger, critical nutrient concentration - concept and determination (graphical and statistical procedures), critical nutrient range, diagnosis recommendation and integrated system (DRIS).</p>	
Module IV Integrated Nutrient Management	20%
<p>Descriptors/Topics</p> <p>Integrated nutrient management (INM): concept, objectives and components; organic farming: principles, practices and its impact on soil processes; precision farming: concept and practices; organic manures including compost, farmyard manure, green manure and crop residues. Fertilizer x water interactions, crop production under fertilizer / water constraints; site-specific nutrient management: concept and practices; summary of long-term fertilizer experiments.</p>	

Course learning outcome:

Student will be able to:

- Understand the basic concept of soil fertility and its evaluation
- Study the concepts of plant nutrition and fertilizers
- Comprehend the basic concepts of integrated nutrient management

Pedagogy for Course Delivery:

The course pedagogy will include lectures, discussion on applications of the topics covered.

List of Professional Skill Development Activities (PSDA):

- Pictorial description of deficiency and toxicity symptoms of essential nutrient
- Transformation and dynamics of major and micronutrients in soil
- Different approaches of soil fertility evaluation
- Detailed review and analysis of long term fertilizer experiments

Lab/ Practicals details:

- Soil and plant sampling and processing for chemical analysis.
- Determination of soil pH, total and organic carbon in soil.
- Chemical analysis of soil for total and available nutrients (major and micronutrients).
- Analysis of plants for essential elements (major and micronutrients).
- Application of green seeker,SPDmeter,LCC,SSNM.

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)
75	25

Theory Assessment (L&T):

Continuous Assessment/Internal Assessment (40%)					End Term Examination (60%)
Components (Drop down)	HA	Q	C	A	End Sem Exam
Linkage of PSDA with Internal Assessment Component, if any	PSDA-1 to 4		PSDA-1 to 4		
Weightage (%)	10	15	10	05	60

Lab/ Practical/ Studio Assessment:

Continuous Assessment/Internal Assessment					End Term Examination
Components (Drop down)	Q	Viva Voce	P	A	End Sem Exam
Weightage (%)	15	10	10	5	60

Mapping Continuous Evaluation Components/PSDA with CLOs:

Bloom's Level >	Remembering	Understanding and Applying	Analysing and	Creating
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Course Learning Outcomes	CLO1	CLO2	Evaluating	
			CLO3	CLO4
Assessment type/PSDA				
Assessment Component 1	✓		✓	
•		✓		
•	✓			
•	✓	✓	✓	✓
•				
•			✓	✓
Assessment Component 'n'	✓	✓		✓

Text Reading:

References:

- Brady, N.C. and Weil, R.R 2002. The Nature and Properties of Soils. 13th Edition. Pearson Education, New Delhi.
- Epstein, E. and Bloom, A. 2005. Mineral Nutrition of Plants: Principles and Perspectives. Second Edition. Sinauer Associates.
- Fageria, N.K., Baligar, V.C. and Jones, C.A. 1991. Growth and Mineral Nutrition of Field Crops. Marcel Dekker, New York.
- Goswami, N.N., Rattan, R.K., Dev, G., Narayanasamy, G., Das, D.K., Sanyal, S.K., Pal, D.K. and Rao, D.L.N. 2009. Fundamentals of Soil Science. Second Edition. Indian Society of Soil Science, New Delhi.
- Havlin, J.L., Beaton, J.D., Tisdale, S.L. and Nelson W.L. 2006. Soil Fertility and Fertilizers: An Introduction to Nutrient management. 7th Edition. Prentice Hall, New Delhi.
- Khasawneh, F.E., Sample, E.C. and Kamprath, E.J. (Editors) 1980. The Role of Phosphorus in Agriculture. Soil Science Society of America, Madison, Wisconsin, USA.
- Marschner, H. 1995. Mineral Nutrition of Higher Plants. Second Edition. Academic Press, London

Additional Reading:

Any other Study Material:

