DEPARTMENT OF AGRONOMY
Faculty of Agricultural Sciences
University of the Punjab, Lahore

Course Outline

Program	B.Sc. (Hons.) Agriculture (Agronomy)	**Course Code**	AGR - 309	**Credit Hours**	3(2-1)
Course Title	**PLANT AND SOIL ANALYSIS**				

Course Introduction

Some basic knowledge about Plant and soil analysis and their importance

To familiarize the students with different methods of plant and soil analysis

Learning Outcomes

On the completion of the course, the students will:

14. Introduction of the students to the plant and soil analysis.
15. Use of different methods for soil analysis in Pakistan.
16. Importance of plant and soil analysis
17. Special practices of the specific methods of plant analysis

Course Content		**Assignments/Readings**
Week 1	***Unit I*** **1.1 Types of different balances**	Westerman, R.L. (Ed.). 1990. Soil Testing and Plant Analysis. 3rd Ed. Soil Sci. Am. Inc., Madison, WI, USA.
	Practical Work Course Introduction	
Week 2	**1.2 Types and use of different balances**	Westerman, R.L. (Ed.). 1990. Soil Testing and Plant Analysis. 3rd Ed. Soil Sci. Am. Inc., Madison, WI, USA.
	Practical Work Demonstration of analytical methods in the laboratory	
Week 3	**Unit II** **2.1 Preparation of Normal solutions of known concentrations-**	Westerman, R.L. (Ed.). 1990. Soil Testing and Plant Analysis. 3rd Ed. Soil Sci. Am. Inc., Madison, WI, USA.

	Practical Work Demonstration of analytical methods in the laboratory	
Week 4	**2.2 Preparation of Molal solutions of known concentrations-**	Westerman, R.L. (Ed.). 1990. Soil Testing and Plant Analysis. 3rd Ed. Soil Sci. Am. Inc., Madison, WI, USA.
	Practical Work Demonstration of analytical methods in the laboratory	
Week 5	**2.3 Preparation of Molar solutions of known concentrations-**	Basak, R.K. 2004. Soil Testing and Recommendation. Kalyani Publisher, New Delhi
	Practical Work Demonstration of analytical methods in the laboratory	
Week 6	**2.4 Preparation of ppm solutions of known concentrations-**	Basak, R.K. 2004. Soil Testing and Recommendation. Kalyani Publisher, New Delhi
	Practical Work Demonstration of analytical methods in the laboratory	
Week 7	***Unit III*** **3.1 Understanding about Preparation of stock solutions**	Basak, R.K. 2004. Soil Testing and Recommendation. Kalyani Publisher, New Delhi
	Practical Work Understanding about recording data in Laboratory	
Week 8	3.2 Preparation of stock solutions for drawing standard curves	Basak, R.K. 2004. Soil Testing and Recommendation. Kalyani Publisher, New Delhi.
	Practical Work Understanding about recording data in Laboratory	
Week 9	MID TERM EXAM	
Week 10	3.3 Understanding about Soil sampling Techniques	Jones, J. Benton. 2012. Plant Nutrition and Soil Fertility

		Manual. 2nd Ed. CRC Press. Taylor & Francis, London. UK.
	Practical Work Understanding about recording data in Laboratory	
Week 11	**3.4 Understanding about Plant sampling Techniques**	Jones, J. Benton. 2012. Plant Nutrition and Soil Fertility Manual. 2nd Ed. CRC Press. Taylor & Francis, London. UK.
	Practical Work Understanding about recording data in Laboratory	
Week 12	**Unit IV** 17.1 Preparation of Plant samples for analytical work	Jones, J. Benton. 2012. Plant Nutrition and Soil Fertility Manual. 2nd Ed. CRC Press. Taylor & Francis, London. UK.
	Practical Work Understanding about recording data in Laboratory	
Week 13	**4.2 Preparation of Soil samples for analytical work**	Jones, J. Benton. 2012. Plant Nutrition and Soil Fertility Manual. 2nd Ed. CRC Press. Taylor & Francis, London. UK.
	Practical Work Computation work and Recommendations.	
Week 14	**4.3 Understanding about Estimation of EC**	Hussain, T. and A. Jabbar. 1985. Soil and Plant Analysis. Department of Soil Science, University of Agriculture, Faisalabad.
	Practical Work Computation work and Recommendations	
Week 15	**Unit V** 5.1 Understanding about Estimation of pH	Hussain, T. and A. Jabbar. 1985. Soil and Plant Analysis. Department of Soil Science, University of Agriculture, Faisalabad.
	Practical Work Computation work and Recommendations	
Week 16	5.2 Understanding about Estimation of Nitrogen, Phosphorus and Potassium	Hussain, T. and A. Jabbar. 1985. Soil and Plant Analysis.

		Department of Soil Science, University of Agriculture, Faisalabad.
	Practical Work Computation work and Recommendations	
Week 17	5.3 Understanding about Estimation of Sodium (Na) and Organic matter	Hussain, T. and A. Jabbar. 1985. Soil and Plant Analysis. Department of Soil Science, University of Agriculture, Faisalabad.
	Practical Work Revision of practical work	
Week 18	FINAL TERM EXAMS	

Textbooks and Reading Material

12. Textbooks.

In the detailed course outline, one may mention chapters of the textbook with the content topics

13. Suggested Readings

13.1. Books

1. Basak, R.K. 2004. Soil Testing and Recommendation. Kalyani Publisher, New Delhi.
2. Hussain, T. and A. Jabbar. 1985. Soil and Plant Analysis. Department of Soil Science, University of Agriculture, Faisalabad.
3. Ryan, J., G. Estefan and A. Rashid. 2001. Soil and Plant Analysis Laboratory Manula. 2nd Ed., ICARDA, Aleppo, Syria and NARC, Islamabad, Pakistan.
4. Tandon, H.L.S (Ed.). 2001. Methods of Analysis of Soils, Plants, Waters and Fertilizer. Development and Consultation Organization, New Delhi, India.
5. Westerman, R.L. (Ed.). 1990. Soil Testing and Plant Analysis. 3rd Ed. Soil Sci. Am. Inc., Madison, WI, USA.
6. Jones, J. Benton. 2012. Plant Nutrition and Soil Fertility Manual. 2nd Ed. CRC Press. Taylor & Francis, London. UK.

13.2. Journal Articles/ Reports

Note:

1. It is preferable to use the latest available editions of books. Mention the publisher & year of publication.
2. The References/ bibliography may be by the typing manual of the concerned faculty/subject. Preferably follow the APA 7th Edition publication manual.

Teaching Learning Strategies

1. White board and markers
2. Slide projector or multimedia
3. Overhead projector

4. Photocopy machine or photocopying facilities
5. Reference books
6. Journals
7. Internet (web cited literature)
8. Field Tours

Assignments: Type s and Number with Calendar

1. Assignment (10 Marks)
2. Continuous assessment (Quizzes) (10 Marks)
3. Class participation Discussion, field trip, regularity, punctuality (5 Marks)

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Continuous assessment includes Classroom participation, assignments, presentations, viva voce, attitude and behavior, hands-on activities, short tests, projects, practical's, reflections, readings, quizzes, etc.
3.	Final Assessment	40%	There is a Written Examination at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course, the teacher may assess their students based on term papers, research proposal development, field work, report writing, etc.