



Subject Module
 Department of Agrotechnology
 Faculty of Agriculture
 University of Islam Malang

Module Handbook

Module Title	Soil and Plant Analysis Techniques
Module Level, if available	Undergraduate Study Program of Agrotechnology
Subject Code	MKP 60603
Headings, if available	-
Subject (MK)	Soil and Plant Analysis Techniques
Semester	6
Subject Coordinator	Dr. Ir. Nurhidayati, MP
Teaching Team	-
Language of instruction	Indonesian language/English
Linkages with the Curriculum	Study Program : Agrotechnology Specialization: Agrotechnology Type: Compulsory /elective
Learning Methods and Duration	<ol style="list-style-type: none"> 1. Lecture: 100 minutes/meeting (7 meetings) 2. Practicum 170 minutes/meeting (7 meetings) 3. Structured Assignments/individual and group Assignments presentation
Student Study Load	<ol style="list-style-type: none"> 1. Lecture: 100 minutes/meeting (7 meetings) 2. Practicum: 170 minutes/meeting (7 meetings) 3. Structured Assignments/quiz/group presentation 4. Attendance: 75% of total attendance
Credit Weight	2 credits or 5.1 ECTS
Requirements for Passing the Subject	<ul style="list-style-type: none"> • Attendance >75% • The final score of all the components of the learning evaluation >44 <p>The final score component:</p> <ul style="list-style-type: none"> • 20% Midterm Exam • 20% Final Exam • 40% Practicum • 10% Structured Assignments (individual and group) • 10% Presence
Prerequisite Subjects	Basic Soil Science
Learning Outcomes	<p>The expected learning outcomes are:</p> <ol style="list-style-type: none"> 1. Have good and deep knowledge in the field of basic agricultural science that supports Agrotechnology (ILO 3) 2. Able to use tools, methods, and processes to solve various field problems in agriculture (ILO 6) 3. Able to apply various research methods in the field of Agrotechnology (ILO 7) 4. Able to work independently or in a team, and use various methods of communication (ILO 4)
Learning Content	After completing this Subject students are able to:

1. understand the importance of soil and crop analysis in agricultural research
2. perform soil and plant sampling techniques correctly
3. perform soil and plant analysis correctly in the laboratory using standard methods
4. interpret the data based on the results of soil and plant analysis
5. prepare fertilization recommendations based on the results of soil and plant analysis

The topics include:

1. Introduction

- The importance of soil and plant analysis
- Understanding soil and plant analysis
- Purpose and benefits of soil and plant analysis
- Soil analysis stages

2. Principles of Soil Sampling

- The importance of soil sampling in soil analysis
- When to do Soil Sampling
- Frequency of Soil Sampling for soil fertility evaluation purposes
- Soil sampling techniques and methods

3. Preparation of Soil Samples

- Types of soil samples for soil analysis in the laboratory
- Method of preparing soil samples
- Types of soil analysis

4. Methods of Soil Chemical Analysis

- Types of soil analysis methods (qualitative and quantitative analysis)
- Physical, chemical and physico-chemical methods in soil analysis
- Types of reactions in soil chemical analysis

5. Interpretation of Soil Analysis Results and Fertilization Recommendations

- The basis for the interpretation of the results of the soil analysis
- Assessment Criteria of Soil Chemical Properties
- Calculation of the determination of fertilizer requirements based on the results of soil analysis

6. Technique of Taking Representative Plant Samples

- Plant tissue analysis
- How to take representative plant samples
- Plant parts used for plant tissue analysis

7. Interpretation of Plant Analysis Results

- The range of macro and micro nutrient concentrations in various plant tissues based on sufficient or excessive grouping of deficient (insufficient)
- Common symptoms due to nutrient deficiency and excess in plants

8. Quick Test Method For Plants Analysis

	<ul style="list-style-type: none"> • How to take plant samples in the field • Plant sampling procedure in the field <p>9. Practical sampling methods and soil sampling in the field 10. Practicum Measurement of soil organic C content 11. Plant digestion practicum 12. Practicum of Analysis of P content of soil and plant 13. Practicum of Analysis the K content of soil and plants 14. Analysis of soil and plant Ca content 15. Soil respiration analysis</p> <ul style="list-style-type: none"> •
Test Terms and Forms	<p>Examination requirements: A minimum of 75 % attendance to attend the final exam</p> <p>Forms of examination: Essay</p>
Learning Media	<p>Projector and screen, Zoom application, Google Classroom, WA Group, Practical guide book, soil and plant samples for analyzing in the laboratory</p>
References	<ol style="list-style-type: none"> 1. Jones, T.B.JR. 1984. Laboratory Guide of Exercises in Conducting Soil Test and Plant Analyses 2. _____. 1984. Plant Analyses Handbook for Georgia. 3. Tan, K.H. 1996. Soil Sampling, Preparation, and Analysis. 4. Westwerman, R.L., J.V. Baird, P.E. Fixen, D.A. Whitney. 1990. Soil Testing and Plant Analysis. Madison, Wisconsin, USA. 5. Anonymous. 2013. Soil Sampling. Midwest Laboratories, Inc. • 13611 B Street • Omaha 6. Yash P. Kalra. 1998. <i>Handbook of Methods for Plant Analysis</i>. Soil and Plant Analysis Council, Inc. CRC Press. Boca Raton Boston London New York Washington, D.C.

