



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

Module Handbook

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| Module Title | Agricultural Mathematics |
| Module Level, if available | Undergraduate Study Program of Agrotechnology |
| Course Code | MKD 40511 |
| Headings, if available | - |
| Course (MK) | Agricultural Mathematics |
| Semester | 1 |
| Course Coordinator | Prof. Dr. Ir. Agus Sugianto, ST., 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 | 1. Lecture: 100 minutes/meeting (9 meetings) 2. Practicum 170 minutes/meeting (5 meetings) 3. Structured Assignments/individual and group Assignments presentation |
| Student Study Load | 1. Lecture: 100 minutes/meeting (9 meetings) 2. Practicum: 170 minutes/meeting (5 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 Course | <ul style="list-style-type: none"> • Attendance > 75% • The final score of all the components of the learning evaluation > 44 The final score component: <ul style="list-style-type: none"> • 25% Midterm Exam • 25% Final Exam • 20% Practicum • 20% Structured Assignments (individual and group) • 10% Presence |
| Prerequisite Courses | - |
| Learning Outcomes | The expected learning outcomes are: <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 work independently or in a team, and use various methods of communication (ILO 4) 3. Able to solve problems that arise in the field of agrotechnology and related fields of science (ILO 5) |
| Learning Content | After completing this course students are able to: Students can understand the basics of mathematics and its application in agriculture (Agrotechnology) etopics include: |

1. NATURE OF LEARNING MATHEMATICS

- Benefits of learning mathematics
- The Nature of Mathematics
- Relationship between Mathematics and Technology
- Relationship of Mathematics with Discipline and Critical Thinking

2. MATHEMATICS LOGIC

- The Nature of Logic
- Benefits of Logic
- Application of Mathematical Logic
- Closed and open sentences

3. RELATIONS, FUNCTIONS, AND VARIABLES

- Relationships
- Function
- Variable

4. EQUATION AND INEQUALITY OF FUNCTIONS

- Preliminary
- Variable
- Coefficients and Constants
- Equations and Inequality
- Raising and factoring

5. LINEAR FUNCTIONS AND ITS APPLICATIONS

- Preliminary
- Function with one independent variable
- Function with two independent variables
- Inclination and point of intersection of axes
- General Equation of Linear Function
- Application of Linear Function

6. QUADRATIC FUNCTIONS AND ITS APPLICATIONS

- Preliminary
- Determination of fertilization dose
- Optimum timing

7. APPLICATION OF SQUARE FUNCTIONS IN AGRICULTURE

- Preliminary
- Solving system of linear equations
- Linear dependency equation

8. EXPONENT FUNCTIONS AND ITS APPLICATIONS

- Preliminary
- Exponent Function
- Logarithmic Functions
- Bacterial Growth Function

9. LOGARITH FUNCTIONS AND ITS APPLICATIONS

- Introduction
- Logarithmic Functions
- Calculation Function
- Calculation of Solution pH
- Concentration Calculation

10. SEQUENCES AND ITS APPLICATIONS

- Preliminary
- Arithmetic sequences and series

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| | <ul style="list-style-type: none"> • Geometric sequences and series • Determination of leaves in monocotyledonous and dicotyledonous plants <p>11. DIFFERENTIAL CALCULUS</p> <ul style="list-style-type: none"> • Preliminary • Limit Concept • Differentiation rules • Function optimization <p>12. INTEGRAL CALCULUS</p> <ul style="list-style-type: none"> • Preliminary • Indeterminate integral • Certain integrals • Integral Application <p>13. DIFFERENTIAL AND INTEGRAL APPLICATION IN AGROTECHNOLOGY</p> <ul style="list-style-type: none"> • Preliminary • Weight Calculation • Calculation of leaf area |
| 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 | Projector and screen, Google Classroom, WA Group |
| References | <p>Main References: Sugianto, A., 2017. Matematika Pertanian. Unisma Press. Malang</p> <p>Supporting References:</p> <ol style="list-style-type: none"> 1. Hazewinkel, M, ed. (2001), Logarithmic Function, Encyclopedia of Mathematics, Springer 2. Soekadijo, R.G. 1999. Logika Dasar Tradisional, Simbolik, dan Induktif. PT. Gramedia Pustaka Utama. Jakarta. 3. Sugianto. 2000. Matematika Pertanian. FP. UB. Malang. 4. Sugianto, A. 2008. Desain Percobaan Terapan. FP. Unisma. Malang. 5. Sugianto, A. 2008. Statistika Terapan. Alpha Media, Surabaya. 7. Theresia dan M.H.T. Seputro. 2002. Pengantar Dasar Matematika Logika dan Teori Himpunan. Erlangga. Jakarta. |