



Module Description/Course Syllabi

Study Programme : Magister of soil science

Faculty of Agriculture.

Universitas Andalas

1. Course number and name

MIT 81211 Rice Field Management

2. Credits and contact hours/Number of ECTS credits allocated

3 sks (3-0)

3. Instructors and course coordinator

1. Dr. Ir. Gusnidar, MP 2. Prof. Dr. Ir. Yulnafatmawita, M.Sc 3. Dr. Ir. Teguh Budi Prasetyo, MS

4. Text book, title, outhor, and year

1. Sanchez, P.A. 1976. Properties and management of soils in the tropics. John Wiley & Sons Inc., New York, 618 pp.
2. Puslittanak. 2004. Tanah sawah dan teknologi pengelolaannya. Editor: F.Agus, A.Adimihardja, S.Hardjowigeno, A.M.Fagi, dan W.Hartatik. Jakarta.
3. IRRI. 1985. Soil physics and rice.
4. Soekardi et al. 1993. Karakteristik Tanah sawah di Indonesia . Risalah Seminar Hasil Penelitian Tanah dan Agroklimat. PPTA Bogor, hal 41-47
5. De Datta, S.K. 1981. Principles and Practices of Rice Production. John Wiley & Sons, New York, 618 pp.
6. Ponnamperna, F. N. 1972. The Chemistry of submerged soils. Adv, Agron, 24:29-96.
7. . 1978. Electrochemical changes in submerged soils and the growth of rice.

In. Soil and Rice. IRRI. Los Banos. Laguna Phillipines. Halaman 421-439.

8. . 1985. Chemical Kinetics of wetland rice soil relative to soil fertility. In Wetlands Soils: characterization, classification, and utilization. IRRI. Los Banos. Phillipines. Manila. Halaman 71-89.

9. Agus, F. 2019. Penilaian Adaptasi dan Inventarisasi gas Rumah kaca sektor pertanian. Balitbangtan, Kementan. Jakarta. 154 halaman.

10. Prasetyo, T. B. 1996. Perilaku asam-asam organik meracuni pada tanah gambut yang diberi garam Na dan beberapa unsur mikro dalam kaitannya dengan hasil padi. Disertasi Doktor. Program Pascasarjana, IPB. Bogor. 190 halaman.

11. Hardjowigeno, S. dan M. Luthfi Rayes. 2001. Tanah Sawah. Program Pascasarjana IPB. Bogor. 155 halaman.

12. Gusnidar. 2007. Budidaya dan Pemanfaatan Tithonia diversifolia untuk Menghemat Pemupukan N, P, dan K Padi Sawah Intensifikasi. [Disertasi]. Padang. Program Pascasarjana Universitas Andalas. 256 hal.

13. Gusnidar, et al. 2008. Pemanfaatan gulma Tithonia diversifolia dan jerami sebagai bahan organik in situ untuk mengurangi penggunaan pupuk buatan serta meningkatkan hasil padi sawah intensifikasi. Laporan Penelitian KKP3T. Kerjasama UNAND-Litbang Pertanian. Padang.

14. Noor, M. 1996. Padi Lahan Marginal. Penebar swadaya. Jakarta. 213 halaman.

15. Taher, A., M. H. Abbas, dan Yurnalis (ed.). 1990. Pengelolaan sawah bukaan baru, prospek dan masalah. Faperta UNES dan Balittan Sukarami. Padang.

5. Specific course information

A. Brief description of the content of the course (catalog description)

This course requires the development of a creative mindset based on the basic sciences having been studied. Students must be able to analyze rice field conditions and problems as well as to maintain the productivity by using non-renewable natural resources for achieving sustainable agriculture. Furthermore, students must be able to determine types of polluted materials in rice fields and how to naturally solve the problems. It is also discussed the CH₄ emission and technique to control it from the rice field. Therefore, it is more oriented to natural methods in managing rice fields.

B. Course Content

Week Course Content

1. Introduction

- Background and Objectives
- Potency of Rice field in Indonesia
- Environmental aspects of rice field
- Rice field conversion
- Problems of rice field

2. Physiography and Classification of rice field

- Rice field based on the physiography (Upland, Lowland, Tidal Swamp)
- Rice field based on the original soil & the water source - Rice field based on the management

3. Morphology of rice field

- Types of rice field morphology
- Profile of paddy soil and factors affecting the formation - Development of rice field profile from upland and lowland soils

4. Soil physical requirements for rice field:

- Fine texture
- puddling
- low permeability
- high water need
- flooded effect on soil physical properties
- Adaptation of rice crops on flooded land
- Water stress sensitivity

5. Reclamation of soil physical properties of rice field:

- Teknologi Pengendalian Pencemaran Fisika Lahan Sawah
- Mitigation of CH₄ gas from rice field
- Management of rice field for rotation with dryland crops

6. Soil chemical properties of rice field:

- The change of soil chemical properties of rice field
- Relationship between soil chemical properties of rice field and growth &

production of rice crops

7. Fertility of rice field:

- Natural nutrient sources
- Macro- and micro-nutrient content

8. MIDTERM Exam

9. Technology for management of soil chemical properties of paddy soils :

- Nutrient status of paddy soil for fertilizer recommendation
- Techniques of nutrient management in recent rice field
- Techniques of nutrient management in intensification rice field

10. - Technology of microbe fertilizer for increasing Fertilizer Use Efficiency (FUE) as well as rice production sustainability

11. - Sources of chemical pollution in rice field

- Techniques for managing chemical pollution in rice field

12. Rice field management in marginal dry land: - Land preparation

- Water management
- Fertilization
- Cropping pattern

13. Rice field management in peat soil:

- Land preparation
- Water management
- Fertilization
- Cropping pattern

14. Economic analysis of integrative farming system of rice Field in Acid Sulfate soil

- Land preparation
- Water management

<ul style="list-style-type: none"> - Fertilization - <u>Cropping pattern</u> <p>15. Rice field management in swamp</p> <ul style="list-style-type: none"> - Land preparation - Water management - Fertilization - <u>Cropping pattern</u> <p>16. FINAL EXAM</p>
<i>C. Semester when the course unit is delivered</i>
Even Semester
<i>D. Mode of delivery (face-to-face, distance learning)</i>
Face to Face
<i>6. Intended Learning Outcomes (CPL)</i>
<p>ILO 2 : An ability to classify soil, to evaluate land capability and suitability, as well as to determine the alternative utilization for sustainable agriculture and environment</p> <p>PI 3 : an ability to determine suitable land use management</p>
<p>ILO 3 : An ability to use technology in identifying and solving problems of soil, land resource, environment problems independently, eligibly, and accurately</p> <p>PI 3 : An ability to conserve soil for sustainable agriculture and environment</p>
<i>7. Course Learning Outcomes (CPMK) ex. The student will be able to explain the significance of current research about a particular topic</i>
<p>2. Students will be able to find out the best method to conserve soil problem for sustainable agriculture and environment</p>

3. Students will be able to innovate in soil science and management of land resources
4. Students will be able to design and evaluate the work of the team
8. <i>Learning and teaching methods</i>
Cooperative Learning and Case Base Method.
9. <i>Language of instruction</i>
Bahasa and English (English Class)
<u>10. <i>Assessment methods and criteria</i></u>
Summative Assessment :
1. Independent tasks/small tasks : 5 %
2. Large tasks/group tasks : 5%
3. Quiz : 5 %
4. Practicum : 25%
5. Mid Semester : 25%
6. Final Semester : 25%
7. Integrity, discipline, hard work, courtesy/ethics/have values, and confidence (character), presence : 5%
Formative Assessment:
1. Thumb up and thumb down
2. Minutes paper