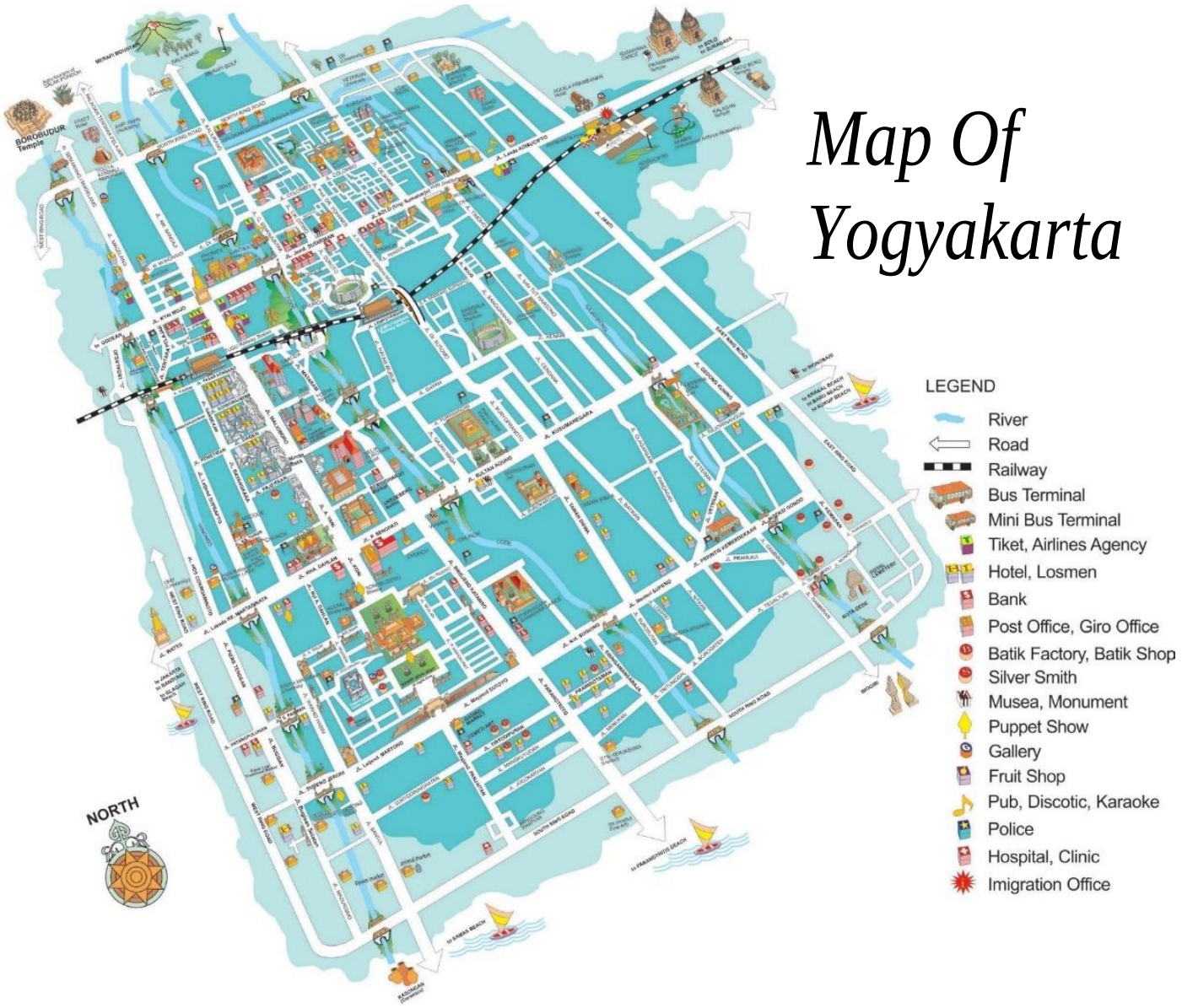
THE ACADEMIC HANDBOOK FOR UNDERGRADUATE PROGRAM
FACULTY OF AGRICULTURE UNIVERSITAS GADJAH MADA

Edition 2018

Map Of Yogyakarta



PREFACE

This Academic Handbook of Undergraduate Program (S1), Faculty of Agriculture UGM, 2017 print edition, is substantially the same as the previous edition but with slight adjustments. This book contains information about the faculty, the rules and steps of the educational process. It is hoped that this book can be comprehended and implemented by every member of the academic community of this faculty, including the students, lecturers and staffs.

We would like to express our gratitude and appreciation to the board of the department, study program, curriculum team, drafting team, lecturers and staffs of the faculty who have contributed their opinions, suggestions, recommendations, and corrections for the improvement of this book.

This book is opened for improvement; therefore, inputs, recommendation, suggestion, and corrections are welcomed. Last but not least, we hope that this book can be useful at its best.

Yogyakarta, August 2017

Dean,

Dr. Jamhari, S.P.,M.P.

THE DRAFTING TEAM OF THE ACADEMIC HANDBOOK FOR UNDERGRADUATE PROGRAM
FACULTY OF AGRICULTURE UGM

No.	Name	Position
1	Dr. Jamhari, S.P., M.P.	Person in charge
2	Dr. Rudi Hari Murti S.P., M.P.	Director
3	Dr. Ir. Triyanto, M.Si.	Director
4	Dr. Ir. Sri Nuryani Hidayah Utami, MP., M.Sc.	Director
5	Dr. Eko Setyobudi, S.Pi., M.Si.	Chairman
6	PinjungNawang Sari, S.P., M.Sc.	Secretary I
7	M. SaifurRahman, S.P., M.P., Ph.D.	Secretary II
8	Agus Sudarwinto, S.E., M.M.	Member
9	Dr. Panjisakti Basunanda, S.P.,M.P.	Member
10	Dr. Ir. Aziz Purwantoro, M.Sc.	Member
11	Prof. Dr. Ir. Triwidodo Arwiyanto, M.Sc.	Member
12	Dr. Ir. Benito Heru Purwanto, M.S., M.Agr.Sc.	Member
13	Dr.Ir. Ustadi, M.P.	Member
14	Dr. Ir. Murwantoko, M.Si.	Member
15	Dr. Ir. Djumanto, M.Sc	Member
16	Prof. Dr. Ir. Sunarru Samsi Hariadi, M.Si.	Member
17	Dr. Ir. Any Suryanti M.M.	Member
18	Dr. Ir. Jaka Widada, M.P.	Member
19	Ningsririsdiyati, S.E.	Member
20	Subarjo	Member

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BRIEF HISTORY AND DEVELOPMENT OF THE FACULTY

1. History and Development

1.1. The Establishment

Due to the growing battle in Jakarta and Surabaya, in addition to progressively uncertain conditions in the end of 1945, the Government of the Republic of Indonesia decided to move the higher education institutions to safer areas. Hence, the Academy of Medicine and Dentistry was established by the Ministry of Health in Malang and Klaten by February and March 1946, respectively. This had been the encouragement that fostered other ministries to participate in establishing universities on their respective fields. In the same year, the Ministry of Kemakmoeran established three Agricultural Universities, consisting of two academic universities in Klaten and Malang, and one semi-academic university in Yogyakarta. On 27 September 1946, the "University of Agriculture "and “Academy of Agriculture” were officially established in Klaten and Yogyakarta by the "Ministry of Kemakmoeran of the Republic of Indonesia".

In 21 July 1947, Malang was occupied by the Netherland. The “Pergoeroean Tinggi” in the city, including “Pergoeroean Tinggi Pertanian”, was disproved. The students who had finished their studies continued their study in Klaten. On 19 December 1948, the Netherlands took aggression massively and destroyed the buildings constructed by the Government of Republic of Indonesia, including buildings of higher education institutions. All higher educational institutions in Klaten was closed, including the Perguruan Tinggi Pertanian and all of the equipment were evacuated to safer places.

In May 7, 1949 "Roem-Royen" was established. It enables the Government of the Republic of Indonesia to return to Yogyakarta. College as one of the instruments of the country should also be re-established. as the consequence, the one in Klaten was not possible to continue because the government wanted to center all of the tertiary institutions in Yogyakarta and moved it from Klaten to Yogyakarta. The government needed to ensure that the educational activity was still going although the truce had not been aided. On November 1, 1949, the Faculty of

Agriculture as one part of the College Complex in Ngasem was officially opened. The *Baccaloreat* system in the faculty had caused the Agricultural Academy led to the semi-academy institution to be discontinued. The students of the academy who wanted to continue their education were allowed to apply to the Faculty of Agriculture after taking the Chemistry and Physics tests. Furthermore, in subsequent developments, it became a state faculty which at that time were still under the related ministries.

Private faculties in Yogyakarta that were currently under the Yayasan Balai Perguruan Tinggi Gadjah Mada, in 7 December 1949 were given to the Government.

On 19 December 1949, the Government of the Republic of Indonesia inaugurated the establishment of the State University of Gadjah Mada under the Ministry of Teaching and Culture Education, which included the following Faculties:

1. Faculty of Medicine, Dentistry and Pharmacy;
2. Faculty of Engineering;
3. Faculty of Literature, Pedagogic and Philosophy;
4. Faculty of Agriculture;
5. Faculty of Law, Economy and Social-Politic;
6. Faculty of Veterinary Medicine

1.2. Period 1949-1963: Faculty of Agriculture and Forestry

As one of the faculties in Universiti Gadjah Mada, the Faculty of Agriculture (Fakultit Pertanian) was automatically bound with the same task from the university as stipulated in the Article 3 Government Regulation Number 37 of 1950 in the field of agricultural science, which was:

1. Shaping human beings who were capable and have conviction, responsible for the welfare of the people of Indonesia in particular, and the world in general, to be independent in pursuing agricultural science and to take up the post of state or community work that required education and teaching of agricultural science;
2. Shaping human beings with moral, to be skilled, had the conviction and responsible for the welfare of society.
3. Putting efforts and developing the agricultural science.
4. Executing development efforts, maintaining, and developing the social and cultural life.

The pioneer who gave enthusiasm in establishing the Faculty of Agriculture which at that time (1946) was still called the Pergoeroean Tinggi Pertanian and based in Klaten, was Ir. Goenoeng Iskandar, the Secretary General of the Ministry of Kemakmoeran. The first Dean of the Faculty of Agriculture was Prof. Ir. Harjono Danusastro, who served from November 1, 1949 until the 1961/1962, while the first secretary was Prof. Iso Reksohadiprodjo. Permanent lecturers and non-permanent lecturers who pioneered the formation of sections and majors of the faculty:

Prof. Iso Reksohadiprodjo : Agricultural Economy
Prof.Ir. Koesnoto Setyodiwirjo : Soil Science and Selection (Plant Breeding)
Prof. Dr.F.H.C.C.A. Vos : Entomology
Prof. Ir. F. Versteegh : Forest Influence Science and Forest Soil Science

Prof. Ir. G.A.W. Van de Goor: Cultivation Science
Prof. Ir. F.K.M. Steup : Silviculture, Systematic dan Geography Of plants
Prof. Ir. C. Gartner and Prof. Ir. E. Lundquist : Forestry Business Science

The sections and major/departments formed at that time were the Agriculture Majors, with sections: Agricultural Economic Investigation, Public Planting, Soil and Fertilizers, Technical Culture, and Agricultural Technology. Starting in the 1951/1952 academic year, the Forestry Section was opened. The number and sections/majors in the Agriculture Section did not change. In early 1954, the Facultit of Agriculture produced the first five scholars.

In the 1955/1956 to 1962/1963 academic years, the name of the Faculty of Agriculture was changed to the Faculty of Agriculture and Forestry, Universitas Gadjah Mada, Yogyakarta. The term *Universitit* and *Fakultit*, at the beginning of 1955/1956, the Government was replaced to *Univeristas* and *Fakultas*. Starting in 1957/1958 academic years and the following years, the prospective students must take entrance exam

At the beginning of 1960/1961 academic year, a learning system development called the guided learning system was applied. This system began on September 1, 1961 and applied for all levels, and specifically for students at the Propaedeuse level. They received tutoring assistance and guidance in the form of tutors. Due to the limited fund, the system only lasted until the 1963/1964 academic year.

1.3. Period 1963-1999: Faculty of Agriculture

Based on the Decree of the Minister of Higher Education and Science Number 99 of 1963, starting from August 17, 1963 the Faculty of Agriculture and Forestry, Universitas Gadjah Mada was divided into three faculties:

1. Agriculture.
2. Forestry; and
3. Agricultural Technology.

In the beginning of the 1963/1964 academic year, the Faculty of Agriculture was developed into 2 sections: Agriculture and Fisheries. The Agriculture Department consisted of the following majors:

1. General Cultivation Science.
2. Selection/Plant Breeding Science;
3. Agricultural Statistic;
4. Agricultural Economy;
5. Soil and Fertilizer Science;
6. Agricultural Microbiology;
7. Agricultural Meteorology;
8. Plant Pest Science;

9. Plant Disease Science;

Fisheries section only had one major:

1. Fishery.

Since the 1968 academic year, Faculty of Agriculture had undergone various changes of curriculum, while the number and type of sections remained unchanged. Major changes to the education system began in the 1972 academic year which were in force with various developments to the present. The name of the institutional section was changed into *department*, with the Agriculture Selection and Statistics Section being part of the Department of Agronomy, and the Agricultural Meteorology Section being the part of the Department of Soil Science. Overall, the departments of the faculty:

1. Agronomy
2. Agricultural Socio-Economic
3. Soil Science
4. Agricultural Microbiology
5. Plant Pests Science/Entomology
6. Plant Disease Science /Phytopathology
7. Fishery Science

Faculty of Agriculture UGM applied the semester and credit system. The "Bakaloreat" terminal education can be taken within 4 years, in which students must take subjects as much as 145-150 credits. Within two years, undergraduate education, student must take 24-30 credit, 1 credit for seminar and 6-10 credit for theses. Workshops on preparations were established in 1972. The preparation of the bakaloreat paper was also required. Real work on the bakaloreat level began in 1975. Graduation of a level was based on an "achievement index".

In line with the Government policy for the Higher Education System, since 1979 the faculty implemented/followed the Multistrata System (S1, S2, and S3 or undergraduate, graduate and doctoral graduate).

In 1984, institutional arrangement was made based on the Decree of the Minister of Education and Culture of the Republic of Indonesia No. 0553/0/1983. The institutional term of Department was changed back to Major, accompanied by a change in the name of the field of expertise/science. Since then, there were 5 majors in the faculty:

1. Agronomy
2. Agriculture Socio-Economy
3. Soil
4. Plant Pest and Disease
5. Fishery

Such development of the Majors was continued through institutionalization of the elements of the Study Program in 1986 based on the Decree of the Minister of Education and Culture of the Republic of Indonesia Number 22/DIKTI/Kep/85 and the Decree of the Director General of Higher Education Number 221/DIKTI/Kep/1996 which was a follow up step up of the development of the National Curriculum (Decree of the Minister of Education and Culture Republic of Indonesia Number 0331/U/1994).

1.4. Period 2000 - Now: *PTN Badan Hukum* (State-Owned University with Legal Entity)

In line with the Government Regulation No. 153 of 2000 in regard to the establishment of Universitas Gadjah Mada as a State-Owned University Legal Entity, it was required that the organization in the Faculty of Agriculture UGM should be adjusted to the stipulation and demands for the development of science and technology.

Based on this consideration and given with the importance of the Agricultural Microbiology Study Program, particularly the development of modern biotechnology, the Study Program (PS) was "been reopened" based on UGM Rector's Decree No. 121/P/SK/HKTL/2003. In accordance with the Rector's Decree, the management of Agricultural Microbiology Study Program was under the coordination of the Dean. Since July 2009, the study program had become the Department of Agricultural Microbiology based on UGM Rector's Decree No. 294/P/SK/HT/2009. In 2015 adjustments were made from Department in accordance with Rector's Decree 1618/P/SK/HT/2015. Thus, the Departments and Study Programs currently available at the Faculty of Agriculture at UGM are as shown in Table 1.

A brief history of each Department in the UGM Faculty of Agriculture is as follows:

1.4.1. Department of Agronomy

In 1955/1956 academic year, the Department of Agriculture Cultivation initially consisted of the Public Planting Section and the UGM Faculty of Agriculture and Forestry Selection section. In the 1962/1963 academic year, the Section of General Planting and Selection was selected. Subsequently, in 1972 academic year, it was changed to the Department of Agronomy of the Faculty of Agriculture UGM before changed to the Department of Agricultural Cultivation of the Faculty of Agriculture of the Faculty of Agriculture and from 1984/1985 to 2014. It consisted of Agronomy and Plant Breeding study programs. However, starting in 2015, the Agronomy Study Program pioneering only the Department of Agriculture, including Prof. Ir. Harjono Danoesastro, Prof. Dr. Ir. Soedharoedjian Ronoprawiro, Prof. Dr. Ir. Soemantri Sastrosoedarjo and Prof. Dr. Ir. Soemartono Sastrowinoto.

Table 1. Department, Study Program, and Concentration/Interest

Department	Study Program and concentration/interest
1. Agronomy (2015 Plant Agronomy)	Plant Agronomy 1. Concentration/Interest in Breeding Agronomy Studies 2. Concentration/Interest in Breeding Studies 3. Concentration/Interest in Seed Technology Studies
2. Plant Pest and Disease	Plant Pest and Disease Science
3. Fishery	1. Aquaculture 2. Fisheries Resource Management 3. Fishery Product Technology
4.Agriculture Socio-Economy	1. Agriculture Socio-Economy/Agrobusiness 1.1. Concentration/Interest in Agricultural Economic Studies 1.2. Concentration/Interest in Agrobusiness Studies 2. Agricultural Counseling and Communication
5. Soil Science	Soil Science
6. Agricultural Microbiology	

1.4.2. Department of Plant Protection

The existence of this Department began with the establishment of the Entomology Section at the Faculty of Agriculture and Forestry in 1955/1956, and in 1960/1961 it was changed to the Plant Pest and Disease Section. In 1972, the department name was changed to the Department of Plant Sciences Pest and Disease and was split into the Department of Plant Pest and Phytopathology in 1979. Starting in the academic year 1984/1985, the name of the department changed to the Department of Plant Pest and the Department of Plant Disease. Some educators who "gave birth" to this field of science were Ir. Samino Wirjosoehardjo, Ir. Supratoyo, Prof. Dr. Ir. Soeprapto Mangundihardjo, Prof. Dr. Ir. Haryono Semangun, Prof. Dr. Ir. Triharso, and Prof. Dr. Ir. Kasumbogo Untung, M.Sc. Based on the exemplary

figures, currently most of the teaching staff in the Department have occupied senior positions as professors and hold doctoral degrees. This strong potential has succeeded in building a very wide network in terms of research and science development both nationally and internationally. The work of the educators includes the BAN Dikti Assessor of KAN-BSN (National Accreditation Committee-National Certification Agency), UGM and DP2M researcher reviewers, consultants and resource persons on plant protection issues, researchers with various competitive grants from ACIAR, JSPS, various universities in Japan, Korea and the United States, Higher Education Research and Technology, Ministry of Agriculture, Regional Government, and so on.

1.4.3. Department of Fisheries

The Department of Fisheries was established in 1963 on the initiative of Prof. Ir Soedarsono Hadisapoetro, as the Dean of the Faculty of Agriculture UGM and Prof. Ir. Haryono Danusastro and Ir. RM. Tejoyuwono Notohadiprawiro, with Mr R.S. Atmohardjono assisted by Dr. Ir. Bambang Soebiantoro, M. Sc as Board of the department. At that time the Department was located in the Faculty of Agriculture building in Sekip. In March 1984 the Department of Fisheries moved to Bulaksumur. At present the Department has three Study Programs: Aquaculture, Fisheries Resource Management, and Fishery Product Technology. Given the enormous potential of fisheries resources in Indonesia and the increasingly important role of the fisheries subsector in National Development, the status of the Department will be upgraded to become the Faculty of Fisheries. Preparations for the establishment of the Faculty are continuing.

1.4.4. Department of Social Agricultural Economics

The Department of Social Agricultural Economics was established at the same time as the Faculty. Based on Government Regulation No. 37 of 1950 it was referred to as the Agricultural Economic Inquiry Section until 1972. In the beginning, the section was led by Prof. Iso Reksohadiprodjo, the first agricultural economist in Indonesia, and then continued by Prof. Ir. Soedarsono Hadisapoetro. Since 1972, with the introduction of the credit system, the section has been changed to the Department of Agricultural Economics, led by Prof. Ir. Soedarsono Hadisapoetro, until 1978, which was later continued by Ir. Mudjijo Prodjosuhardjo. Since 1984, the section changed to the Department of Agriculture Socio-Economy. Since the 1986/1987 academic year, the Agricultural Counseling and Communication Study Program was established. It aims to develop the knowledge related to agricultural information dissemination. At present the Department has two Study Programs: Agriculture Socio-Economy/Agribusiness and Agricultural Counseling and Communication.

The predecessor figures of the Department gave very significant contribution in formulating the national BIMAS program and building the BUUD/KUD concept. The Department is actively conducting various research collaborations, both with national and international institutions such as FAO, IRRI, ADB, WWF, JSPS, SEARCA, ACIAR, JIRCAS, and others.

1.4.5. Department of Soil Science

In 1949, the Department of Soil Science was initially developed as the Soil Science Section of the Faculty of Agriculture with Prof. Ir. Koesnoto as the head, assisted by other pioneers such as Prof. Ir. R. Soeroso Notohadiprawiro, In 1963 the soil science section was changed to the Soil and Fertilizer section; then in the academic year 1970/1971 it was changed to Department of Soil Science with four specializations: Soil Physics, Chemistry and Soil Fertility, Pedology, Soil and Water Management, and Agro Meteorology. Since 1983 the department has been renamed as Department of Soil Science. The pioneering figures include Prof. Dr. Ir. Soegiman, Prof. Dr. Ir. KPH Tejoyuwono Notohadikusumo, and Ir. Suseno Prawirowardoyo.

In the 1970-1980 era, the department established collaboration with the Ministry of Public Works and the Ministry of Transmigration of the Republic of Indonesia to develop agriculture in

tidal areas (UGM P4S), especially in Kalimantan and Sumatra. Dr. Tejoyuwono Notohadiprawiro and Dr. Soeprapto Soekodarmodjo were in collaboration with Gent University Belgium in the framework of strengthening the Ministry of Land both in research and education. This collaboration succeeded in strengthening the Soil Physics laboratory and Soil Fertility and Chemistry Laboratory with a variety of cutting-edge equipment and produced a Doctorate for the department educational staff. In the era of 2000 - 2010 the Department carried out land collaborated with researchers and ACIAR Australia to address the problem of acid soils in Indonesia, especially Kalimantan, led by Prof. Rachman Sutanto. Prof. Bostang Radjagukguk continues the collaboration with the Ministry of Land and the European Union Peat Society (IPS) conducting the RESTORPEAT, STRAPEAT AND TROPEAS projects in handling peatland issues. Starting in 2008 - 2010 the Department received student exchange (S2) from Yamagata University Japan. The contribution of the Department through the activities of educative staff includes the wetlands (Swamp and Peat) legislation. At present (2011-2014), the Department collaborates with the Center for Land Research, Bogor and the University of Gent, Belgium carrying out collaborative research on organic agriculture in Central and West Java. Contribution is also given by the Department through the activities of the educational staffs, such as in the case of legislation on wetlands (Swamp and Peat), land reclamation post to the eruption of Merapi, printing of paddy soil etc.

1.4.6. Department of Agricultural Microbiology

The Agricultural Microbiology Study Program is a study program that manages the unity of study about agricultural resources that are biological, beneficial, and sustainable. Many aspects of agriculture can only be explained by the concept of microbiology. It is also a very important basis in the development of modern biotechnology.

In 1950, a few years after the establishment of the Faculty, a Microbiology Laboratory was established which later developed into the Microbiology Section in 1963. Starting in 1972, the Section was upgraded to the Department of Microbiology and subsequently became the Department of Microbiology. Based on the Decree of the Minister of Education and Culture No. 22/DIKTI/Kep/85, the Department of Microbiology is merged with the Department of Soil Science to become the Department of Soil. In further developments based on UGM Rector's Decree Number 121/P/SK/HKTL/2003 the Agricultural Microbiology Study Program was reopened and separated from the Department of Soil. The Agricultural Microbiology Study Program officially became the Department of Agricultural Microbiology based on UGM Rector's Decree No. 294/P/SK/HT/2009 concerning the Opening of the Department of Agricultural Microbiology at Universitas Gadjah Mada.

The pioneering figures who developed the Agricultural Microbiology include Prof. Dr. Ir. Joetono, Prof. Dr. Ir. Joedoro Soedarsono, Ir. Sri Hartadi, Prof. Dr. Ir. Siti Kabirun, Ir. Suhadi Darmosuwito, M.Sc., and Ir. Soesanto.

2. Environmental Situation

At the moment the Faculty is located in the complex of Universitas Gadjah Mada Campus, Yogyakarta. The buildings situated on two areas: in Bulaksumur and on Jalan Colombo, Kuningan. Geographically the location of the Faculty is on altitude of 137 meters above sea level with an average temperature of 30oC. Transportation to the UGM Campus is very easy because most of the public transport vehicles go through the UGM complex, including the location of Faculty. The Faculty within its developing educational activities, researchers and community service are supported by libraries, experimental farms, and PT. Pagilaran. The Library of the Faculty has tens of thousands of book collections including textbooks, reference books and special collections, thesis research reports, theses, and dissertations. It is also equipped with various collections of magazines and scientific journals, both in print and electronic editions (on-line) subscribed to by the University

Library. In addition to the Faculty Library, references are also available at the UGM Library I and II Technical Implementing Units, each Department, and each Lecturer Staff. Starting in 2002 the UGM Library of Agriculture uses the SIPUS (Library Information System) program and supported by a bar code system. Under such system, it is easier to find circulation data and lending volumes that enables users to easily find the libraries they need. It is also accessible by login to http //lib.faperta.ugm.ac.id.

Experimental Farms consist of farms managed by the faculty, which are Tridharma Farm located in Banguntapan, Bantul and in Kebempuan, Purworejo; in addition to one managed by the universities, such as the Agricultural Farm for Education, Research and Development (Agricultural, Training, Research and Development Station (KP4-ATRD) in Kalitirto, Berbah, Sleman. In addition, the Faculty also collaborates with PT. Pagilaran and other companies to support the Tridarma of Higher Education activities.

In the effort to establish better communication with students' parents/guardians, on March 17, 1996 the Faculty of Agriculture UGM Student Cooperation and Communication Board (BAKKOMA) was established with the aim of increasing collaboration and communication between parents/guardians of students with the academic community of the faculty, improving student creativity and achievement, and helping to solve problems related to the smooth study of students.

3. Faculty Contributions

The education program in the Faculty has delivered many contributions in the form of educated human resources that are spread in various development fields/sectors, at international, national and regional levels. Many alumni of the Faculty have assumed the duties of in government ministrial, including Prof. Ir. Soedarsono Hadisaputro, Ir. Wardoyo, and Ir. Djamaluddin Suryo Hadikusumo, in addition to other important positions in national and international institutions. The Faculty has also contributed in the form of development of science, technology and development concepts, including:

a. Being the pioneer on the birth of UUPA (Basic Agrarian Law);
b. Developing institutional agricultural business units: BUUD/KUD (Village Unit Business Entity/Village Unit Cooperative), Perkebunan Inti Rakyat (PIR), especially tea and cocoa commodities;
c. Developing various superior commodities, including dryland rice varieties (Gama 61, Gama 87 and Gama 318), local black soybean varieties superior to Mallika, and Legin (Leguminosa Inoculum);
d. Developing the Integrated Pest Management (IPM) program;
e. Taking part in the development of national agriculture and fisheries programs, including the development of tidal land and coastal sand, developing agricultural land at transmigration sites, and developing Kedungombo reservoir fisheries;
f. Playing an active role in the conservation efforts of Borobudur Temple;
g. Developing and commercially producing vaccine A. *hydrophila* and Vibrio to support fish farming businesses;
h. Taking an active role in land rehabilitation following the eruption of Merapi.

ORGANIZATIONAL STRUCTURE

Based on the Decree of the Board of Trustees of the University of Gadjah Mada Number 12/SK/MWA/2003 concerning the Bylaws of the University of Gadjah Mada. Organization in a faculty consists of: Faculty Senate; Faculty Heads; Department/Section; Laboratory/Studio; Faculty Administrative Implementation Unit; and other supporting units.

The Faculty of Agriculture UGM is led by a Dean, assisted by 3 Vice Deans: Vice Dean for Academic and Student Affairs, Vice Dean for Research, Collaboration, and Community Service, and Vice Dean of Finance, Assets and Human Resources.

In carrying out the duties and mission of the *Tridarma* of Higher Education, the Faculty coordinates the elements of academic organizers consisting of departments with their respective study programs, as follows:

1. Department of Agronomy
   a. Agronomy Study Program
   b. Plant Breeding Study Program (starting 2015, admonition for new students was closed and the study program became an Interest study in the Agronomy Study Program)
2. Department of Plant Protection
   a. Plant protection Study Program
3. Department of Fisheries
   a. Aquaculture Study Program
   b. Fisheries Resource Management Study Program
   c. Fishery Product Technology Study Program
4. Department of Social Agricultural Economics
   a. Agricultural and Agribusiness Economics Study Program
   b. Agricultural Counseling and Communication Study Program
5. Department of Soil
   a. Soil Science Study Program
6. Department of Agricultural Microbiology
   a. Agricultural Microbiology Study Program

1. Heads of the Faculty

Service Period 2017 – 2021
Dean: Dr. Jamhari, S.P., M.P.
Vice Dean of Academic and Student Affairs: Dr. Rudi Hari Murti, S.P., M.P.
Vice Dean of Research, Cooperation, and Community Service: Dr. Ir. Sri Nuryani Hidayah Utami,M.P., M.Sc.
Vice Dean of Finance, Asset, and: Suadi, S.Pi., M. Agr. Sc., Ph.D. Human Resources

2. Supporting Units

Head of Experimental Farm : -

3. Academic Organizers

3.1. Department of Agronomy

1. Board of the department
   Head of Department : Dr. Ir. Endang Sulistyaningsih, M.Sc.

Secretary : Ir. Supriyanta, M.P.

2. Head of the Study Program
   (1) Agronomy : Rani Agustina Wulandari, S.P., M.P., Ph.D.

3. Head of Laboratory
   (1) Plant Production Management : Dr. Eka Tarwaca Susila Putera, S.P.
   (2) Plant Breeding : Dr. Ir. Aziz Purwantoro, M.Sc.

4. Permanent lecturers
   (1) Aziz Purwantoro, Dr., Ir., M.Sc.
   (2) Agus Budi Setiawan, S.P., M.Sc., Ph.D.
   (3) Budiastuti Kurniasih, Ir., M.Sc. Ph.D.
   (4) Didik Indradewa, Prof., Dr., Ir., Dip.Agr.St.
   (5) Dody Kastono, S.P., M.P.
   (6) Dyah Weny Respatie, S.P, M.Si.
   (7) Eka Tarwaca Susila Putra., S.P., M.P., Ph.D.
   (8) Endang Sulistyaningsih, Dr., Ir., M.Sc.
   (9) Erlina Ambarwati, S.P., M.P.
   (10) Panjisakti Basunanda, Dr., S.P., M.P.
   (11) Prapto Yudono, Prof., Dr., Ir., M.Sc.
   (12) Rani Agustina Wulandari, Dr. S.P., M.P.
   (13) Rohlan Rogomulyo, Ir., M.P.
   (14) Rudi Hari Murti, Dr., S.P., M.P.
   (15) Sri Muhartini, Ir., S.U.
   (16) Supriyanta, Ir., M.P.
   (17) Siti Nurul Rofiqo Irwan, S.P., M.Agr., Ph.D.
   (18) Taryono, Dr., Ir., M.Sc.
   (19) Rizky Pasthika Kirana, S.P., M.Sc.
   (20) Taufan Alam, S.P., M.Sc
   (21) Valentina Dwi Suci Handayani, S.P., M.Sc., Ph.D.

5. Impermanent Lecturers
   (1) A.T. Soeyono, Prof (ret) Dr. Ir.
   (2) Dr. Ir. Nasrullah, MSc.
   (3) Setyastuti Purwanti, Dr. Ir., M.S.
   (4) Sriyanto Waluyo, Dr. Ir., M.Sc.
   (5) Suyadi Mitrowiyardjo, Dr.,Ir., M.Sc.

3.2. Department of Plant Protection

1. Board of the department
   Head : Dr. Ir. Witjaksono, M.Sc.
   Secretary : Dr. Tri Joko, S.P., M.Sc.

2. Heads of the Study Program
   - Plant Protection : Arif Wibowo, Dr., Ir., M.Agr.Sc.
   - Secretary : Dr. Ir. Witjaksono, M.Sc.

3. Head of Laboratory
   (1) Plant Pest Laboratory: Alan Soffan, S.P., M.Sc., Ph.D.
   (2) Plant Disease Laboratory : Dr. Suryanti, S.P., M.P.
   (3) Control Technology Laboratory : Prof. Dr. Ir. Y. Andi Trisyono, M.Sc.

4. Permanent lecturers
   (1) Achmadi Priyatmojo, Prof., Dr., Ir., M.Sc.
   (2) Y. Andi Trisyono, Prof., Dr., Ir., M.Sc.
   (3) Ani Widiastuti, Dr., S.P., M.P.
   (4) Arif Wibowo, Dr., Ir., M.Agr.Sc.
   (5) Arman Wijonarko, Dr., Ir., M.Sc.
   (6) Bambang Hadisutrisno, Prof., Dr., Ir., D.A.A.
   (7) Edhi Martono, Prof., Dr., Ir., M.Sc.
   (8) Nugroho Susetyo Putro, Dr., Ir., M.Si.
   (9) Sedyo Hartono, Dr., Ir., M.P.
   (10) Siti Subandiyah, Prof., Dr., Ir., M.Agr.Sc.
   (11) Siwi Indarti, Dr. Ir., M.P.
   (12) Sri Sulandari, Dr., Ir., S.U.
   (13) Suputa, Dr.,S.P., M.P.
   (14) Suryanti, Dr., S.P., M.P.
   (15) Susamto Somowiyarjo, Prof., Dr., Ir., M.Sc.
   (16) Tri Harjaka, Dr., S.P., M.P.
   (17) Trijoko, Dr., S.P., M.Sc.
   (18) Triwidodo Arwiyanto, Prof., Dr., Ir., M.Sc.
   (19) F. X. Wagiman, Prof., Dr., Ir., S.U.
   (20) Witjaksono, Dr., Ir., M.Sc.
   (21) Dr. Alan Soffan, S.P., M.Sc.
5. Impermanent Lectures
   (1) Mulyadi, Prof. (ret.) Dr.,Ir., M.Sc.
   (2) Christanti Sumardiyono, Prof., Dr., Ir., S.U.

3.3. Department of Fisheries

1. Board of the department
   Head : Dr. Ir. Murwantoko, M.Si.
   Secretary : Dr. Eko Setyobudi, S.Pi., M.Si
2. Head of the Study Program
   (1) Aquaculture : Dr. Ir. Bambang Triyatmo, M.P.
   Secretary : Noer Kasanah, Apt., M.Si., Ph.D
   (2) Management : Dr. Ir. Djumanto, M.Sc. Sumberdaya Perikanan
   Secretary : Eko Setyobudi, Dr., S.Pi., M.Si.
   (3) Result Technology : Prof. Dr. Ir. Ustadi, M.P. Perikanan
   Secretary : Siti Ari Budhiyanti, Dr, STP, MP.
3. Head of Laboratory
   (1) Fish Processing technology : Dr. Siti Ari Budhiyanti, S.T.P.,M.P.
   (2) Fishery Product Quality and Safety : Prof. Dr. Ir. Ustadi, M.P.
   (3) water resource management : Dr. Ir. Djumanto, M.Sc.
   (4) Socio-Economic Fisheries and Fishing : Suadi, S.Pi., M.Agr.Sc., Ph.D.
   (5) Fish and Environmental Health : Dr. Ir. Alim Isnansetyo, M.Sc.
   (6) Aquaculture : Dr. Ir. Ign. Hardaningsih, M.Si.
4. Permanent lecturers
   (1) Alim Isnansetyo, Dr., Ir., M.Sc.
   (2) Anes Dwijayanti, SPi, MSc.
   (3) Amir Husni, Dr., S.Pi., M.P.
   (4) Bambang Triyatmo, Dr.,Ir., M.P

(5) Dini Wahyu Kartika Sari, S.Pi., M.Si.
(6) Djumanto, Dr., Ir., M.Sc.
(7) Eko Setyobudi, Dr., S.Pi., M.Si.
(8) Faizal Rachman, S.Pi.M.Sc.
(9) Hery Saksono, Ir., M. A.
(10) Ignatius Hardaningsih, Dr., Ir., M.Si.
(11) Indun Dewi Puspita, S.P., M.Sc.., Ph.D.
(12) Indah Istiqomah, Dr., S.Pi, M.Si.
(13) Latif Sahubawa, Dr., Ir., M.Si.
(14) Murwantoko, Dr., Ir., M.Si.
(15) Mgs. Muh. Prima Putra, S.Pi., M.Sc.
(16) Namastra Probosunu, Drs., M.Si.
(17) Noer Kasanah, Dr., Apt., M.Si., Ph.D.
(18) Nurfitri Ekantari, Dr. S.Pi., M.P.
(19) Prihati Sih Nugraheni,S.Pi, M.P.
(20) Dr. R.A. Siti Ari Budhiyanti, S.T.P., M.P.
(21) Dr. Ratih Ida Adharini, S.Pi., M.Si.
(22) Rustadi, Prof., Dr., Ir., M.Sc.
(23) Senny Helmiati, S.Pi., M.Sc.
(24) Suadi, S.Pi., M.Agr.Sc., Ph.D
(25) Sukardi, Ir., M.P.
(26) Susilo Budi Priyono, S.Pi., M.Si.
(27) Triyanto, Dr., Ir., M.Si.
(28) Ustadi, Prof.Dr., Ir., M.P.
(29) Wahdan Fitriya, SPi, MSc.
(30) Susana Endah Ratnawati, SPi, M.Si.
(31) Dr.rer.nat. Riza Yuliratno Setiawan, S.Kel.,M.Sc.

5. Impermanent Lecturers
(1) Sukiman Wirosaputro, Ir., M.S.
(2) Retno Widaningroem, Ir., M.Sc.
(3) Supardjo Supardi Djasmani, Ir., S.U.

3.4. Department of Social Agricultural Economics

1. Board of the department
Head : Dr. Jangkung Handoyo Mulyo, S.P., M.Ec.
Secretary : Dr. Subejo, S.P.,M.P.
2. Head of the Study Program
(1) Socio-Economic Agriculture/Agribusiness: Dr. Ir. Any Suryantini, M.M.
(2) Agricultural Communication Extension: Alia Bihrajihant Raya, Dr., S.P., M.P.
3. Head of Laboratory
(1) Agricultural policies and Natural Resurces: Prof. Dr. Ir. Irham, M.Sc
(2) Agribusiness : Prof. Dr. Ir. Masyhuri
(3) Agricultural Communication Extension: Dr. Ir. Roso Witjaksono, M.Sc.
4. Permanent lecturers
(1) Alia Bihrajihant Raya, Dr., S.P., M.P.
(2) Anung Pranyoto, S.P., M.P., M.Ec.
(3) Any Suryantini, Dr., Ir., M.M.
(4) Arini Wahyu Utami, S.P., M.Sc.
(5) Dwidjono Hadi Darwanto, Prof., Dr., Ir., M.S.

(6) Dyah Woro Untari, S.P., M.P.
(7) Fatikiyah Rohmah, S.P., M.Sc.
(8) Gilang Wirakusuma, S.P., M.Sc.
(9) Harsoyo, Ir., M.Ext.Ed.
(10) Hani Perwitasari, S.P., M.Sc.
(11) Irham, Prof., Dr., Ir., M.Sc.
(12) Jamhari, Dr., S.P., M.P.
(13) Jangkung Handoyo Mulyo, Dr., S.P., M.Ec.
(14) Lestari Rahayu Waluyati, Dr., Ir., M.P.
(15) Masyhuri, Prof., Dr., Ir.
(16) Pinjung Nawang Sari, S.P., M.Sc.
(17) Roso Witjaksono, Dr., Ir., M.S.
(18) Slamet Hartono, Dr., Ir., S.U., M.Sc.
(19) Sri Peni Wastutiningsih, Dr. Agr., Ir.
(20) Sri Widodo, Prof. (Emer)., Dr., Ir., M.Sc.
(21) Subejo, S.P., M.Sc., Ph.D.
(22) Sugiyarto, S.P., M.Sc.
(23) Suhatmini Hardyastuti, Dr., Ir., M.S.
(24) Sunarru Samsi Hariadi, Prof., Dr., Ir., M.Si.
(25) Ratih Inekewati SP, M.Agr., PhD.

5. Impermanent Lecturers
(1) Djuwari, Dr., Ir.
(2) Moersantoro P., Ir.
(3) Supriyanto, Ir., M.Sc.
(4) Sutrilah, Ir., MS.
(5) Ken Suratiyah, Ir., S.U.

3.5. Department of Soil Science

1. Board of Department
Head : Dr. Ir. Benito Heru Purwanto, MP., M.Agr.
Secretary : Dr. Agr. Makruf Nurudin, S.P., M.P.
2. Head of the Study Program
: Dr. Ir. Benito Heru Purwanto, MP., M.Agr.
3. Head of the Laboratory
(1) Laboratory of Soil Science : Dr. Ir. Eko Hanudin, M.P.
4. Permanent lecturers
(1) Azwar Ma'as, Prof., Dr., Ir., M.Sc.
(2) Bambang Hendro Sunarminto, Prof., Dr., Ir., S.U.
(3) Benito Heru Purwanto, Dr., Ir., M.S., M.Agr.Sc.
(4) Cahyo Wulandari, Dr., S.P., M.P.
(5) Eko Hanudin, Dr., Ir., M.P.
(6) Makruf Nurudin, Dr., S.P., M.P.
(7) Nasih Widya Yuwono, S.P., M.P.
(10) Nur 'Ainun Harlin Jennie Pulungan, Dr., SP, M.Sc.
(11) Rachmad Gunadi, Dr. Ir., M.Si.
(12) Sri Nuryani Hidayah Utami, Dr., Ir., M.P., M.Sc.
(13) Suci Handayani, Ir., M.P.
(14) Andi Syahid Muttaqin, S.Si.,M.Si.

5. Impermanent Lecturers
   (1) Bambang Djadmo Kertonegoro, Prof. (net) Dr. Ir.
   (2) Soepriyanto Notohadisuwarno, Prof., Dr., Ir., M.Sc.
   (3) Dja'far Shiddieq, Dr., Ir., M.Sc
   (4) Mulyono Nitisapto, Ir., M.S.
   (5) Rosich Attaqy, Ir., M.Sc.

3.6. Department of Agricultural Microbiology

1. Board of the department
   Head : Ir. Donny Widianto, Ph.D.
   Secretary : Ir. Jaka Widada, M.P., Ph.D.
2. Head of the Study Program
   Agricultural Microbiology : Dr. Ir. Jaka Widada, M.P.
3. Head of Laboratory
   Agricultural Microbiology : Ir. Donny Widianto, Ph.D.
4. Permanent lecturers
   (1) Donny Widianto, Ir., Ph.D
   (2) Erni Martani, Prof., Dr., Ir.
   (3) Irfan Dwidja Prijambada, Ir., M.Eng., Ph.D.
   (4) Jaka Widada, Dr., Ir., M.P.
   (5) Muhammad Saifur Rohman, S.P., M.Si., M.Eng., Ph.D.
   (6) Ngadiman, Dr., Ir., M.Si.
   (7) Sebastian Margino Prof., Dr., Ir.
   (8) Siti Kabirun, Prof. (Emer)., Dr., Ir.
   (9) Sri Wedhastri, Dr., Ir., M.S.
   (10) Triwibowo Yuwono, Prof., Ir., Ph.D.
   (11) Desi Utami, S.P.,M.Sc
5. Impermanent lecturers
   (1) Suhadi Darmosuwito, Ir., M.Sc.
   (2) Soesanto, Ir.

In addition to lecturers from faculties, there are additional lecturers from other faculties within and from outside of UGM.

4. Administrative Staffs

1. Head of Administration office : Agus Sudarwinto, S.E., M.M.
2. Head of Academic and Student Affairs: Ningsririsdiyati, S.E.
3. Head of Finance dan General Affairs : Maria Kusuma Wardani, S.E.
4. Domestic Affair Coordinator : Sri Darwanti
5. Equipment Affair Coordination : Giyanto
6. Finance Affair Coordinator : -
7. Human Resource Affair Coordinator : Sunaryanto
8. Librarian Coordinator : Lalili Hidayati, S.Sos, M.A.
9. Administration coordinators in Department
   (1) Department of Agronomy : Heni Wantoro, S.E.
   (2) Department of Agricultural Socio-Economic : Muslimin, S.P., M.P.
   (3) Department of Plant Pest and Disease: M.G. Ari Haryati
   (4) Department of Fisheries : Nur Ari Purnomo, S.Pi.

(5) Department of Soil : Isnu Andriastuti, A.Md.
(6) Department of Agricultural Microbiology : Illuminata Kartiwi

ACADEMIC REGULATIONS

1. Credit System

Educational activities in the Faculty of Agriculture, Universitas Gadjah Mada implements the credit system within certain period set in semester system. The planning, preparation and implementation of educational programs use the credit units as the benchmarks of the educational loads, especially concerning the study loads for the students.

1.1. Definitions and Objectives of Credit System

The credit system is a system of organizing education using a credit unit to declare the study loads of a student, lecturer workloads, learning experiences, and program implementation loads. With the students having different interests, talents, and abilities, they are not entitled to have same composition of activities or completion from one another, even if they are at the same level of education.

The main purposes of credit system implementation:

1. To provide opportunities shortest possible time of completion of study for capable and diligent students.
2. To provide opportunities for the students to take part in educational activities that are in accordance with their interests, talents, and abilities.
3. To simplify the student skills evaluation system.

1.2. Semester Credit Unit (SCU)

The educational load measurement regarding the study load for the students as well as the teaching load for the lecturers is required. Such measurement is stated as the credit units. Under the semester system used by the Faculty, the credit unit is also adopted and called as the *semester credit unit* (abbreviated as *SCU*). It is an appreciation unit used to measure the learning experience obtained by each student within one semester. Students should determine their educational activity such as lectures, laboratory practicum, field practicum, seminars, thesis, and other activities within the *SCU*. The number of SCU of each educational activity is based on the number of hours used for that activity.

1.2.1. SCU for Class

Classical activity of one SCU is an educational activity within three hours a week. There are 16-20 weeks in a semester which mean that SCU equals to 48-60 hours of educational activity within one semester.

For each student, three hours of educational activity in a week consist of:

1) One hour of classroom, which is scheduled meeting with the lecturer; plus
2) One hour of serial activity, which is unscheduled activity given by the permanent lecturers, such as homework, scientific writing, etc.; and
3) One hour of independent activity by the students themselves.
4) For the lectures, the three hours costs of:
1) One hour in the classroom activity, which is scheduled meeting with the student.
2) One hour of serial and evaluation planning activity, and
3) One hour of subject development.

1.2.2. SCU for the Laboratory Practice

Educational load measuring related to the student capability on psychomotor and physical activity, usually carried out in the laboratory practices, is principally the same as the measurement of classical activity. The difference is that one hour of classroom is assumed to have equal load to 2-3 hours of physical or psychometric. Thus, on SCU of this activity is the same as 2-3 hours load hours or psychomotor activities plus 1 hour of series activities, for example, for making reports and 1 hour for independent activities. The total number is 4-5 hours a week or 64-80 hours in one semester. If a lecture is accompanied by a laboratory practice, the lecture activities and laboratory practices are arranged in accordance with the number of each credit.

1.2.3. SCU for Field Practice

SCU for field practice is based on the SCU for laboratory practice, which is 4-5 hours a week in one semester. If the fieldwork is carried out over a long period of time, then to determine the credits it is necessary to consider the average working hours a day used by students and the proportion of the total educational burden in the relevant education level.

1.2.4. SCU for Seminar and Thesis

Calculation of SCU for seminar and thesis is the same as classroom SCU calculation. The activity consists of seminar, classroom meetings, presentation, or tasks given by the lecturers. Calculation of SCU of a researcher for composing thesis is the same as the calculation of and psychometric activities. One SCU comprises 64-80 hours of activity in one semester. Research that is obliged to carry out by the students to compose the thesis in order to obtain the bachelor's degree (S1) is values between 4-6 SCU, with thesis writing included.

1.2.5. SCU of Field Work

Field work is 2 SCU or equals to 25 consecutive workdays (160 working hours).

1.3. Study load in one semester

Study load as well as the study activity taken by a student in one semester are notes that are the same from one to another taken by other students. In determining the study load for one semester a student needs to pay attention to his or her abilities. This can be seen from the results of studies in the previous semester, as measured by the Achievement Index (IP).

Two factors are required to determine the study load per in one semester: the average daily working time and individual abilities. In general, people work an average of 6-8 hours a day for 6 consecutive days. However, a student is required to work above the average. If a student works on normal average of 6-8 hours during the day and 2 hours at night, then he or she is estimated to have 8-10 hours of study time a day. Thus, the bearable study load of a student ranges from 16-20 credits or an average of 20 credits per semester, if it is in the form of classroom activity. Such amount will be reduced when laboratory or field practice is added.

2. Levels and Degrees

One of the educational program in the Faculty of Agriculture in UGM is **Undergraduate Program (S1).** The degree for accomplishing students is **Sarjana Pertanian (S.P.) or Bachelor's Degree in field of agriculture and Sarjana Perikanan (S.Pi.) or Bacheclor's Degree in the field of fishery**.

3. Educational Process

3.1. Requirements

3.1.1. Academic

A student of the Faculty of Agriculture UGM is one accepted through Nation Path of Higher Education Entry Selection (SNMPTN), Higher Education Collaborative Entry Selection (SBMPTN), and UGM Student Entry Selection (UM UGM).

3.1.2. Administration

A student of the Faculty of Agriculture UGM should fulfil the administration as required by the University and Faculty, pay the tuition (SPMA, SPP, and BOP), fill in the Study Plan Card, and other requirements. For students of class 2012/2013 and earlier: SPMA payments are only once during academic activities at the Faculty of Agriculture UGM, SPP payments are made each semester before the semester concerned, and BOP payments are made according to applicable regulations. For students of class of 2013/2014, tuition are paid in accordance with the amount of the Single Tuition Fee (UKT) stated by the Faculty or in refer to applicable regulations.

3.2. Study load and duration

According to the Chancellor Regulation of Universitas Gadjah Mada Number: 581/P/SK/HT/2010 on the General Guidance of the Compilation of the 2010 Curriculum for Undergraduate Study Programs at Universitas Gadjah Mada, the study load of study load for the Undergraduate Program is 144-148 SCU. The Bachelor Program is scheduled for 8 (eight) semesters but can be taken in less than 8 (eight) semesters and for 14 (fourteen) semesters in total. The study period of the class of 2015 class and later is 10 (ten) semesters. The length of study is calculated from the time of registered as a student of the Faculty until graduated at the judicium event.

3.3. Academic Counselling

Every student of the faculty receives academic guidance from lecturers appointed by their respective departments or study programs to facilitate the teaching-learning process. Before each semester is held, students are asked to fill out a online *Study Plan Card* in refer to a predetermined schedule. The card is filled with subjects to be taken after consulting with the supervisor before consulted and approved by the Academic Counsellor. The number of credit taken by each student is based on their respective results of their study in the previous semester and arranged in the system. The card consists of sheets for academic supervisors, academic sections, and students. Changes to the card can be made within the allotted time on the academic calendar. If necessary, other things that might affect the teaching-learning process can be consulted with an Academic Counsellor.

3.4. Cancellation and Status Transfer of the Elective Courses

3.4.1. Cancellation

Cancelling a subject can be carried out during the Study Plan Card changing period under the authorization of the academic supervisor. Cancellation is only allowed within the changing period.

3.4.2. Transferring status of Course

An elective course can be transferred into additional course when the number of credit (courses, practicum, and thesis) taken by students is more than 148 credits. An elective course that has been transferred into elective course must be given with approval by the academic supervisor, counsellor, and board of the department.

Elective course is written on a separate sheet (when required), instead of in the grade transcript sheet.

3.5. Evaluation of Study Results and Deadlines

The aim and purpose of the evaluation is to assess the level of student mastery upon the

teaching material that has been given.

Evaluations can be carried out in various ways, such as written examinations, oral examinations, seminars, writing scientific essays, assignments, quizzes, etc. The method used is in accordance with the nature of educational activities. Components and weight of the assessment for determining the final grade is determined by the lecturer and informed to students at the beginning of lecture.

1) Achievement Index

Starting from Class of 2015:

1) Achievement Index

Evaluation of study results of a student is carried out at the end of the semester, at the end of the fourth semester, and at the end of the study level, by calculating the achievement index (IP). To calculate the achievement index, the grade in letter is transformed to the weight in the form of numbers under the following formula:

Later than Class of 2015:

Letter grade		Weight Value	Letter Grade		Weight Value
A	=	4	C +	=	2,25
A -	=	3,75	C	=	2
A/B	=	3,5	D	=	1
B +	=	3,25	E	=	0
B	=	3			
B -	=	2,75			
B/C	=	2,5			

Prior to class of 2015 :

Grade		Weight
A	=	4
B	=	3
C	=	2
D	=	1
E	=	0

By using weight value, achievement index (IP) can be calculated under the following formula:

$$IP = \frac{\text{Sum (Credit of each course x weight of each course)}}{\text{Sum of credits of all courses}}$$

Especially for the first semester, student takes 20 credits as the course package as according to the curriculum of the faculty.

2) Each semester Study result evaluation

Evaluation of semester study results is done at the end of the semester, covering all educational activities taken by students during the semester. The results of this evaluation are used to determine the number of SCU that can be taken in the following semester. The number of SCU that can be taken in the following semester can be determined based on the achievement index under the following guidelines:

GPA ≥ 3,00	—— Maximal 24 SCU	2,50 - 2,99	—— Maximal 21 SCU
2,00 - 2,49	—— Maximal 18 SCU		
1,50 - 1,99	—— Maximal 15 SCU		
< 1,50	—— Maximal 12 SCU		

3) Evaluation of Study Results within the First Four Semesters

Undergraduate students in the first four semesters must at least be able to complete 30 credits with a minimum achievement index of 2.00 (without E grade) in order to continue to the next semester. If this provision unfulfilled, the student is not permitted to continue study. If students are not expected to reach the requirements, the faculty management will give warning one semester before the final evaluation of the first four semesters taken.

4) Evaluation of Study Results in Eight First Semesters

At the end of the eighth semester students must have obtained at least 80 credits with a GPA of 2.00. Students who are unable to meet these requirements will be given a warning and special attention to expedite their studies

3.6. Examination

The test uses a comprehensive system based on reasoning that emphasizes the study of literature that can follow the development of science. The types of examinations at the Faculty consist of course exams and practicum tests (responsiveness).

3.6.1. Course Examination

The theoretic examination of a course consists of middle and final exams. In addition to periodic assessments, quizzes and assignments can also be held. To be able to take the final semester exams, the minimum attendance of students is 70% of effective meetings. The faculty does not provide supplementary exams except for students with accounted reasons.

3.6.2. Practicum Exams (responsiveness)

The practical examination to assess the knowledge and skills of practicum, is held at least once a semester.

Provisions regarding the Field Work Exam are found in Chapter VI.1 and regarding the Thesis Examination in Chapter VI.4 in this book.

3.7. Course Grade Remedies

Students who are still within the limits of the period of education, according to applicable regulations, are allowed to be given with the opportunity to improve their grades of a course. Improving course grades is only allowed for students with C, D, and E Grades. The best archived grades are used in the transcript.

4. Graduation

Undergraduate Education Program students are declared to have graduated and received Bachelor of Agriculture diploma in agriculture or a Bachelor of Fisheries in fisheries when they meet the following requirements:

1. Cumulative achievement index ≥ 2.0;
2. no E grades;
3. D grades from the credits of activities is less than 25% of the total credits
4. have Compiled and passed the thesis exam.

The graduation predicate for the Undergraduate Program is determined as follows:

1. With praise (Cumlaude)

1) Cumulative achievement index of 3.51-4.00

2) The study period taken is the maximum undergraduate study periods (4 years) plus 1 (one) year.

2. Very Satisfying
1) Cumulative achievement index 2.76-3.50 or
2) Cumulative achievement index 3.51 - 4.00 with study period of more than 5 years

3. Satisfying
Grade Point Average 2.00-2.75

Judicium

Judicium is a decision accomplished in a department or faculty meeting regarding the graduation of a student which is held every month and no later than one month before the graduation ceremony. Students can take part in the graduation if they have fulfilled and submitted the academic and administrative requirements for graduation on the date specified. The time of the graduation is determined by each department, while the graduation follows the University rules. The requirements to attend graduation for prospective graduates are as follows:

5.1. Academic Requirement

1. All courses grades taken have been published; Grades published after the graduation are not counted.
2. Number of credits taken are between 144-148 SCU.
3. No E grade, the total D grade <25% with a GPA ≥ 2.00.
4. have Submitted a ratified thesis by the examiner team, in 5 copies distributed for the examiner lecturer, department, and students, and faculty to be collected to the library in the form of a CD with PDF format.
5. Thesis CD is submitted to the Faculty no later than the day before graduation.

5.2. Administration Requirements

1. Certifying letter of:
   1) Free guaranty from borrowing tools/instrument/finance administration
   2) Free guarantee from borrowing books from the following libraries:
      i) Universitas Gadjah Mada
      ii) Faculty
      iii) Yogyakarta Government (for graduates listed as members)
2. Having the list of Study Result issued by the Academic Section of the Faculty
3. Filling in the diploma order form
4. Have Submitted a legalized (recent) high school diploma
5. Have Submitted 2 pieces of 4x6 recent photograph and 5 pieces of 3x4 (photo for diploma, 3x4 black, white, two ears visible, facing forward, without headgear and eyeglasses, wearing modest collar/tie/suit)
6. Students who choose to collect a veiled photo, are required to make a statement on stamped paper, in duplicate
7. Having toga loan receipt
8. Filling in the graduation data form, each is affixed with 3x4 size photographs
9. Have submitted KAGAMA Member Registration Receipt from Student / Alumni Faculty of Agriculture UGM
10. Have Submitted a certificate of dependency on the Kaliti Agricultural Research and Development Program (KP4) o (for prospective graduates who are conducting researchers for the thesis at KP4)
11. Having awareness test card

12. Have Submitted a list of 4 sheets of attendance examination (3 sheets for Student Affairs and 1 sheet for the Education Section)
13. Have Submitted a photocopy of a valid student card
14. Filling in the application data for transcript
15. Have submitted dean certificate of the submission of thesis *)
16. Have submitted receipt of thesis submission from the department and from the Faculty of Agriculture UGM *)
17. having a graduation fee payment receipt

Note
*) Submitted at no later than one week after Judicium**.**

6. Graduation Ceremony

Submission of a Bachelor of Agriculture or Bachelor of Fisheries diploma is done at graduation. Graduation time following the University requirements.

7. Academic Leave

Academic leave is regulated based on UGM Chancellor Decree No. 2 of 1993 dated September 1, 1993 concerning the Academic Leave Guidelines for UGM Students. The application format can be seen in Appendix 2. The followings are the provisions for academic:

1. What is meant by academic leave is a condition of not being registered as a student of UGM within one semester or more. It is only allowed when written permission from the Dean is provided;
2. Students who do not re-register or take time off from study, their student status in the semester concerned is canceled, and are not allowed to participate in academic activities and use the facilities available;
3. Students within first two years of study are not permitted to take academic leave;
4. The maximum cumulative academic leave allowed is the same with the length of programmed study;
5. Students who will take a leave of absence for up to 2 years, either in a row or not, must submit a request for leave permission to the Dean. Likewise, if they are going to return after their academic leave, students must submit a request for active return to the Dean;
6. Students who will be on leave for more than 2 years, either in a row or not, must submit a request for leave permission to the Rector with a copy to the Dean. Likewise, if they want to return to their activities after academic leave, students must submit a request for active return to the Chancellor with a copy to the Dean;
7. Permission of academic leave from the Dean or Chancellor is not counted as an active period in relation to the study deadline, and during these leave students are free of tuition fee;
8. Students who take academic leave without permission from the Dean for a maximum of 2 years or who take leave without permission from the Chancellor for more than 2 years, and want to be active and allowed by the Dean or Rector are subject to the following conditions:
    1) Academic leave period is considered as active period in relation to the study period deadline
    2) The student must pay tuition fee during the academic leave with the amount as determined to be the same as the new student tuition fee;
    3) During the extension of study time, students are not permitted to take academic

leave.

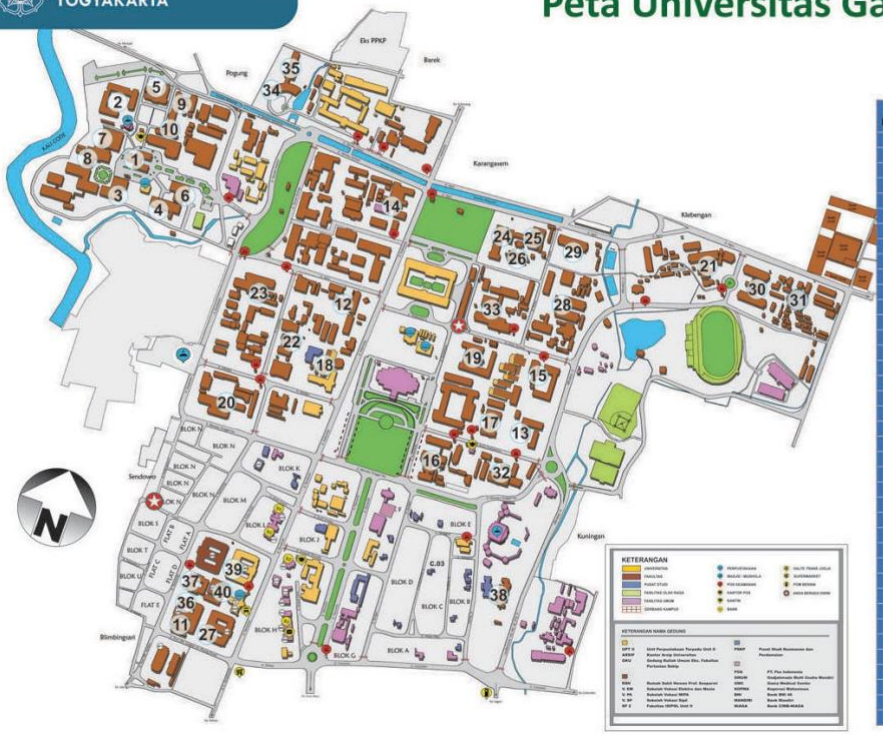
8. Extension of Study

Students who have taken 14 semesters and have not yet passed can apply for an extension of study time. It can be given for maximum of 2 semesters. Students can submit an extension of study time when completing a thesis and repeat a maximum of 2 courses. For students of class of 2015, the study period is 5 years according to the informed consent signed by students. The procedure for extension of study time is as follows:

1. Students must make a letter requesting an extension of study time two months before the end of their study period (14 semesters);
2. The application letter submitted is authorized by the academic supervisor, thesis supervisor and board of the department;
3. Students must make a work plan that will be carried out during the extension of study;
4. Students must make a work plan that will be carried out during the extension of study;
5. During the extension of study time, students are not allowed to take academic leave.
6. Students must sign a stamped statement containing "if the student cannot complete the study within the given time period, then the student will not be permitted to continue the study".
7. Students who have been given 3 (three) warning letters and have not responded within 1 (one) month from the last warning letter are considered resigned and will be processed to be returned to the university.

UNIVERSITAS GADJAH MADA
YOGYAKARTA

Peta Universitas Gadjah Mada



NO LOKASI	FAKULTAS/SEKOLAH
1	KPTU FAK. TEKNIK UGM
2	ARSITEKTUR DAN PERENCANAAN UGM
3	T. ELEKTRO DAN TEKNOLOGI INFORMASI UGM
4	TEKNIK FISIKA UGM
5	TEKNIK GEODESI UGM
6	TEKNIK GEOLOGI UGM
7	TEKNIK KIMIA UGM
8	TEKNIK MESIN DAN INDUSTRI UGM
9	TEKNIK SIPIL UGM - 1
10	TEKNIK SIPIL UGM - 2
11	DIPLOMA TEKNIK ELEKTRO SV UGM
12	FAK. FARMASI UGM
13	FAK. FILSAFAT UGM
14	FAK. GEOGRAFI UGM
15	FAK. HUKUM UGM
16	FAK. ILMU BUDAYA UGM - A
17	FAK. ILMU BUDAYA UGM - B (Gd. F)
19	FAK. ISIPOL UGM - BULAKSUMUR
20	FAK. KEDOKTERAN GIGI UGM
21	FAK. KEDOKTERAN HEWAN UGM - A
22	FAK. KEDOKTERAN UGM - A
23	FAK. KEDOKTERAN UGM - B
24	FAK. KEHUTANAN UGM - A
25	FAK. KEHUTANAN UGM - B
26	FAK. KEHUTANAN UGM - C
27	FAK. MIPA UGM, SEKIP UNIT 3
28	FAK. PERTANIAN UGM - A
29	FAK. PERTANIAN UGM - B
30	FAK. PETERNAKAN UGM - A
31	FAK. PETERNAKAN UGM - B
32	FAK. PSIKOLOGI UGM
33	FAK. TEKNOLOGI PERTANIAN UGM
34	PASCASARJANA UGM UNIT I
35	PASCASARJANA UGM UNIT II DAN III
36	DIPLOMA TEKNIK MESIN SV UGM
37	DIPLOMA TEKNIK SIPIL SV UGM
38	DIPLOMA EKONOMIKA DAN BISNIS SV UGM
39	SEKOLAH VOKASI UGM-KPTU
40	SEKOLAH VOKASI UGM - EKS. PERPUSTAKAAN

FIELD WORK, SEMINAR,COMMUNITY SERVICE PROGRAM AND THESIS

1. Field Work

1.1. Definition

Field work (KL) is an off-campus activity of **working while learning** to develop the students' insight, experience, and practices. The activity is carried out in accordance with the field of agricultural/fishery.

1.2. Objectives

a. To develop the students' skill and to enhance their experiences, practices in field of agricultural/fishery.

b. To develop the students' reasoning sensitivity to various issues that arise in their work fields.

1.3. Requirements

a. Students who have completed subjects and laboratory practices of **minimum 100 credits** with GPA ≥ 2,00 or 80 credits with GPA ≥ 3,00. may apply for Field Work Program in their Study Plan Card.

b. Students will be supervised by a lecturer.

c. The field work is to be carried out in either governmental or private institutions in the field of agriculture and fisheries in the broadest sense within at least 25 consecutive working days (160 hours);

d. Field Work Program is to be carried out during the **holidays** of semester end, or at any time for students who have completed the theory subjects.

e. Costs incurred due to the program and related activity are not burden for the faculty

1.4. Sanctions

Students who violate the procedure of report submission will be subjected to sanctions in the form of Field Work cancellation in addition to repeating the Field Work.

1.5. Field Work Implementation Procedures

1.5.1. Preparation

1. Student must include the subject of Field Work Program in their respective Student Plan Card at the beginning of the semester.
2. Field Work Plan (title, time and place included) should be submitted to the Undergraduate/Work Field Commission in their respective departments at least two months after the current semester. The Field Work plan should be given with verbal/written approval from the targeted institution.
3. The Field Work Commission in each Department determines the supervisor before the students consult their proposals.
4. Students must apply for covering letter from the department and faculty used for Field Work permission approved by the supervisor.
5. Students must attend the briefing given by the Field Work Commission.

1.5.2. Implementation

1. Students must fill in the **daily journal** provided by the faculty during the field work implementation. It consists of motes of the students' daily activity and acknowledged by the supervisor.
   2. Students must apply for Letter of Statement of completing field work (as in example form) from the head of the institution of the field work is.

1.5.3. Report

1. Student is obliged to communicate his or her Field Study to their supervisor **no later than one week** after the field study is finished to prepare the report.
2. Students must submit theory report draft to the supervisor **no later than one month after the field study.**
3. The report consists of:
   a. Introduction: background objectives and benefit.
   b. Condition of the institution where field study carried out: brief description about the institution development and activities.
   c. Implementation: activates during the field study.
   d. Discussion, includes a description of thoughts and opinions about problems related to student disciplines and their solutions
   e. Conclusion.
4. Report is composed under the following format:
   a. Typed on quarto-size HVS paper (A4), with a 1.5 space with the font times new roman 12.
   b. The report cover uses light green buffalo paper.
   c. Cover format as an example.

5. Reports authorized by the supervisor, and the head of the department along with the Bachelor Commission/KL Commission are made in 5 copies, each for the supervisor, department, faculty, institute where the KL, and students are concerned.
6. Submission of reports is no later than one week after the exam

1.5.4. Evaluation

1. Students must the field work exam **no later than three months after completing the field work**
2. Verbal and written exam will be given by the supervisor, or else, in a class seminar.
3. Head of the institution or student advisers during the field work are asked to assess student performance by filling out the forms provided

2. Seminar

2.1. Definition

Seminar is an activity of delivering a literature study or research results in the form of scientific papers through an organized discussion. The paper is written according to the field/interest in the study program taken and must be presented by the students in front of other students and lecturers.

2.2. Objective

To train the students in preparing scientific writing and presenting as well as discussing it in the classroom.

2.3. Requirements

a. Students can submit Seminar courses in the Study Plan Card only if they have taken courses and practicums of **at least 120 credits** (cumulative achievement index ≥ 2.00) or 100 credits (with GPA ≥ 3.0), and passed the Research Methodology course
b. Students will be guided by a seminar supervisor who is assigned by the Seminar Coordinator/Commission;
c. Faculty does not pay the costs of the seminar or other related matters.

2.4. Seminar Implementation Procedure

2.4.1. Preparation

1. Students must write the Seminar course in the Study Plan Card at the beginning of the semester;
2. Students must submit the topic of seminar papers on current issues in their field of science to the Seminar Commission/ Coordinator in their respective departments **no later than one month** after the current semester;
3. The department seminar coordinator/coordinator assigns the seminar supervisors;
4. Students must consult the seminar paper with the supervisor.

2.4.3. Implementation

1. Students must:
   a) submit papers approved by the supervisor to the Seminar Commission/Coordinator post to the seminar and duplicate the papers as many as the seminar participants;
   b) present papers according to the rules set by the Seminar Commission/ Coordinator;
   c) improve the paper according to the input given by the seminar participants and submit it to the supervisor no later than one week after the presentation.
2. Students taking the Seminar Course Subject must:
   a) obey the rules set by the Seminar Commission/Coordinator;
   b) present at least 70% of the seminar event related to his or her study program;
   c) give response to the presentation by asking questions or giving opinions.
3. Seminar Commission/Coordinator must
   a) Explain the etiquette of the seminar to the students;
   b) Decide the supervisor with related background to the topic submitted by the students;
   c) Decide and publish the seminar schedule;
   d) Arrange the time table and allocation as the followings:
      1. Fifteen minutes of presentation.
      2. Forty minutes of discussion.
      3. Five minutes of seminar presentation evaluation given by the supervisor.
4. Supervisor must:
   a) Provide time to guide the students on how to prepare the seminar papers, materials and evaluation;
   b) Supervise the students when presentation takes place;
   c) Reviews the seminar.

d) Give grades to the students giving presentation as well as the participants;
e) Sign the list of attendants;
f) Submit the grades and evaluation to the Seminar Commission/Coordinator.

2.4.4. Guidelines for Compilation of Papers

Seminar paper is prepared under the followings:

complete paper is for supervisor printed on quarto size HVS paper (A4), in 1.5 space, and *Times New Roman 12 or* Arial 11 *font*.

a) Paper for the attendants can either in complete or brief editions.
b) Papier is completed with:
   A. **Title** that implies the contents of the paper;
   B. **Introduction** includes background, relevant issues, and problem formulation;
   C. **Discussion** includes the description other problems and analysis;
   D. **Closing** includes the conclusions;
   E. **Literature Study** incudes the referenced literatures.

3. Community Service Program

Community Service Program (KKN) is a compulsory subject with 0/3 credits that must be taken by every student. The procedures and requirements are as determined later by LPPM UGM.

4. Final Project/Thesis

4.1. Definition

Thesis is a report of undergraduate student researchers applying scientific methods, as part of the requirements for obtaining a Bachelor of Agriculture or Fisheries.

4.2. Objective

To train students to plan, carry out and compile the results of scientific research.

4.3. Procedures

a. Students can submit a Thesis if they have taken a minimum of 120 SCU courses and practicums, D value is not more than 25%, and a cumulative achievement index ≥ 2.00;
b. Students have passed the Research Methodology course.
c. Students will be guided by a supervisor who is assigned by the Department/Study Program Undergraduate Commission;
d. Supervisors must be permanent lecturers the Faculty in accordance with Minister of Administrative Reform and Bureaucratic Reform Regulation No. 17 of 2013, while the Mentoring Advisor can come from outside the study program;
e. The faculty does not cover thesis and related costs.

4.4. Implementation procedures

4.4.1. Proposals Submissions

Students must include the Thesis course in the study plan card at the beginning of the related semester;

1) Students submit the title and outline of the research plan to the Undergraduate Commission no later than one month after the related semester;

2) The Undergraduate Commission assigns a supervising lecturer om related research topic;

3) Students must submit research proposals to the supervisor at least one month after the title is approved. The proposal was consulted with a supervisor.

4.4.2. Research Implementation and Thesis Writing

1) Research can be carried out after the research proposal is approved by the supervisor;
2) Students must report regularly upon the progress of their research to the supervisor during the research;
3) Students immediately finish the thesis after the research ends and consult the supervisor.

4.4.3. Seminar

Seminar of the researcher proposals and/or results are conducted according to the provisions of each Department/Study Program.

4.4.4. Thesis Examination

1) Students can take thesis examination when they have passed all courses taken in accordance with their respective study programs;
2) Students must have taken thesis examination no later than one month after the thesis concept is approved by the supervisor team
3) Thesis examination is taken no later than one week before pre-judicium at the relevant department;
4) Thesis examination is carried out by an examiner team consisting of main supervisor, the supervisor and one other examiner, which is determined by the Undergraduate Commission with the approval of the main supervisor;
5) Thesis Examination is conducted if the student does not have an E grade and D grade is not more than 25% as indicated by the transcript data from the academic section. Students who have passed the thesis examination but have not made any corrections so as they cannot take part in the two pre-judicium are required to repeat the thesis examination.

UNDERGRADUATE PROGRAM CURRICULUM

1. Department of Agronomy

1.1. Agronomy Study Program (starting from Class of 2015 in the study program, the study interest includes Agronomy and Plant Breeding)

Undergraduates Profiles

Undergraduates of Agronomy Study Program should have the following profiles of being:

(1) The actors in the field of Agriculture
(2) The managers (*planner, designer, organizer, evaluator, mediator*),
(3) The businesspersons *(entrepreneur, initiator, adaptor, cooperator)*
(4) The researches, and
(5) The lecturers

Undergraduates Competence

Agronomy Graduates Competence:

1. Competence of Profile (1): the actors in the field of Agriculture:
   a. Having the ability to apply science and technology in the field of crop cultivation

based on the principles of sustainable agriculture both in the modern way as well as by promoting the local wisdom.

b. Having the to communicate in order to fulfil the need of the people.

2. Competence Profile (2): The Managers (*planner, designer, organizer, evaluator, mediator*):
   a. Having the ability to plan and design an effective and productive crop production system.
   b. Having the ability to execute a crop production system planning accurately based on the sustainable agriculture principles.
   c. Having the ability to evaluate and assess the crop production and post-harvest process
   d. Having the ability to actualize their potential to work together in multidisciplinary teams

3. Profile *Competence (3):* The Businessman/woman *(entrepreneur, initiator, adaptor, cooperator)*
   a. Having the courage to start, execute and develop the innovative crop production in sustainable agriculture.
   b. Having the ability to establish cooperation (negotiating and communicating) effectively.
   c. Having the ability to innovate n applying science and technology in crop cultivation into business practices.
   d. Having the ability to apply the agricultural business ethics with environmental insight.

4. Researcher Profile Competence (4):
   a. Having the ability to identify, analyze and formulate problems precisely regarding a sustainable agronomy system.
   b. Having the ability to design and implement researchers as well interpret data professionally.
   c. Having the ability to recommend correct solutions to problems in a sustainable agronomy system.

5. Educator Profile Competence (5): (facilitator, motivator dan mediator):
   a. Being Lifelong learning ability.
   b. Having the ability as analytic and synthetic thinker by calculating the impact of problem solving to social life on global scale.
   c. Having the ability to act as the facilitator, motivator, and mediator systemically and effectively.

Curriculum

SEMESTER I			
No	**Code**	**Course**	**SKS**
1	UNU 1100	Pancasila	2/0
2	BDU 1105	Indonesian Language	2/0
3	MFS 1100	Basic Physics	2/0
4	MFS 1100P	Basic Physics Practicum	0/1
5	MKS 1100	Inorganic Chemistry	2/0
6	MKS 1100P	Inorganic Chemistry Practicum	0/1
7	BIO 1101	General Biology	2/1
8	MMS 1101	Mathematics	3/0
9	PNU 1101	Introduction to Agricultural Science	2/0
10	PNE 1151	Management Basics	2/0
	Credit amount		**20**

SEMESTER II			
No	**Kode**	**Course**	**SKS**
1	UNU 1200	Civic Education	2/0
2	PNA 1240	Agronomy Basics	2/1
3	PNT 1201	Soil Science Basics	2/1
4	PNA 1220	Ecology Basics	2/1
5	MKS 1201	Organic Chemistry	2/0
6	MKS 1201P	Organic Chemistry Practicum	0/1
7	PNP 1201	Agricultural Sociology	2/0
8	PNB 1241	Statistic	2/0
9	PNB 1241P	Statistic Practicum	0/1
10	PNE 1221	Agricultural economy	2/0
	SUM		21

SEMESTER III			
No	**Kode**	**Course**	**SKS**
1	PNB 2111	The basics of Genetics	2/1
2	BDU 2106	English	2/0
3	PNT 2122	Basic climatology	2/1
4	PNH 2110	Plant protection Basics	2/0
5	PNU 2102	Biochemistry	2/0
6	PNU 2102P	Biochemistry Practicum	0/1
7	PNP2100	Basics of Agricultural Counseling and Communication	2/1
8	PNB 2141	Experimental Design	2/1
9	PNE 2153	Agricultural Business Management	2/0
	SUM		**21**

SEMESTER IV			
No	**Kode**	**Course**	**SKS**
1	PNB 2221	Basics of Plant Breeding	2/1
2	PNA 2200	Basics of Plant Physiology	2/1
3	PNH 2220	Basics of Plant Pest Science	2/1
4	PNH 2230	Basics of Plant Disease	2/1
5	PNU 2203	Introduction to Agricultural Biotechnology	2/0
6	PNE 2254	**Entrepreneurship**	2/0
7	PNB 2231	Seed Technology	2/1
8		Elective course	
	SUM	**21-24**	

SEMESTER V			
No	Kode	Course	SKS
1	UNU 310X	Pendidikan Agama	2/0
2	PNA 3144	Cultivation of Seasonal Crops	2/1
3	PNT 3115	Fertilization and Soil Fertility	2/1
4	PNA 3108	Plant Physiology	2/1
5	PNU 3104	Research Method	2/0
6	PNA 3124	Plant Ecology	2/0
7	PNA 3109	Plant Growth and Development	2/1
		Elective course	
	SUM		14-24

SEMESTER VI			
No	Kode	Course	SKS
1	PNT 3225	Agricultural Water Management	2/1
2	PNU 3205	Regional Planning and Development	3/0
3	PNA 3248	Annual Crop Cultivation	2/1
4	PNB 3080	Field Work*)	0/2
5	PNA 3252	Plant Management	2/1
6	PNA 3256	Weed Science	2/1
7		Elective course	
	SUM		19-24

SEMESTER VII			
No	Kode	Course	SKS
1	UNU 4050	Community Service Program*)	0/3
2	PNA 4085	Seminar*)	0/1
3	PNA 4090	Thesis*)	4-6

SEMESTER VIII			
No	Kode	Course	SKS
1	UNU 4050	Community Service Program*)	0/3
2	PNA 4085	Seminar*)	0/1
3	PNA 4090	Thesis*)	4-6

***) can be taken either in odd or even semester**

ELECTIVE COURSE			
Odd semester			
			SKS
1	PNA 3150	Introduction to Planting Systems	2/0
2	PNA 3160	Vegetable Cultivation and Hydroponic	2/1
3	PNA 4186	Special Topic of Agronomy	1/0
4	PNA 3164	Landscape and Ornamental Plant Cultivation	2/1
5	PNA 3166	Medicinal Plant Cultivation	2/0
6	PNA 4128	Agroecology	2/0
7		Courses in other Study Program within UGM	

ELECTIVE COURSE			
Even semester			
No	Code	Course	SCU
1	PNA 3272	Horticultural Post Harvest	2/1
2	PNA 3262	Plant Network Cultivation	2/1
3	PNA 4182	Agronomy Field Assessment	0/2
4	PNA 3270	home yard and fruit Cultivation	2/1
5	PNA 3268	Orchid Cultivation	1/1
6	Courses in other Study Program within UGM		

1.2. Plant Breeding Study Program (Study Interest for Class of 2015)

The Plant Breeding Study Program consists of two study concentrations: the Plant Breeding study and the Seed Technology Study

Graduates Profile

Graduates of the Plant Breeding Study Program have the following profiles:

1) Actors in the field of agriculture, especially Plant Breeding,
2) Managers (planners, designers, organizers, evaluators, mediators),
3) Entrepreneurs (entrepreneur, initiator, adapter, cooperator)
4) Researchers, and
5) Educators

Graduates Competence

Graduates of Plant Breeding are expected to have the following Main Competencies:

1. Having the ability to plan, design and implement science and technology in the field of plant breeding in an effective and productive manner based on the principles of sustainable agriculture both in traditional and modern way that promotes local wisdom
2. Having the ability to evaluate and assess plant breeding and seedling programs.
3. Having the ability to actualize their potential to work together in a multidisciplinary team.
4. Having the courage to start, implement and develop innovative businesses in plant breeding and seed production in sustainable agriculture.
5. Having the ability to carry out effective communication and establish cooperation in a joint manner in order to meet the needs of the community.
6. Having the ability to innovate in applying science and technology in the field of plant breeding

into business practices.

7. Having the ability to apply ethical business in an agricultural business environment
8. Having the ability to correctly identify, analyze and formulate problems regarding plant breeding in a sustainable agronomy system.
9. Having the ability to design and carry out research and interpret genetic data, plant breeding and seeding in a professional manner
10. Having the ability to recommend correct solution of problems in plant breeding to support a sustainable agronomy system.
11. Having the lifelong learning ability.
12. Having the ability to think analytically and synthetically by calculating the impact of problem solving in social life on global scope.
13. Having the ability as systematic and effective. facilitator, motivator, and mediator.

Plant Breeding Study Interest

According to Minister of Education Decree NO: 045/U/ 2002, the competencies of Plant Breeding Study Program graduates must include the following elements of competency:

a. The basis of personality.
b. Mastery of knowledge and skills.
c. Ability to work.
d. Attitudes and behavior in the work.
e. Understanding the rules of community life

SEMESTER I			
No	Kode	Course	SKS
1	UNU 1100	Pancasila	2/0
2	BDU 1105	Indonesian Language	2/0
3	MFS 1100	Basic Physics	2/0
4	MFS 1100P	Basic Physics Practicum	0/1
5	MKS 1100	Inorganic Chemistry	2/0
6	MKS 1100P	Inorganic Chemistry Practicum	0/1
7	BIO 1101	General Biology	2/1
8	MMS 1101	Mathematics	3/0
9	PNU 1101	Introduction to Agricultural Science	2/0
10	PNE 1151	Management Basics	2/0
	SUM		20

SEMESTER II			
No	Kode	Course	SKS
1	UNU 1200	Civic Education	2/0
2	PNA 1240	Agronomy Basics	2/1
3	PNT 1201	Soil Science Basics	2/1
4	PNA 1220	Ecology Basics	2/1
5	MKS 1201	Organic Chemistry	2/0
6	MKS 1201P	Organic Chemistry Practicum	0/1
7	PNP 1201	Agricultural Sociology	2/0
8	PNB 1241	Statistic	2/0
9	PNB 1241P	Statistic Practicum	0/1
10	PNE 1221	Agricultural economy	2/0
	SUM		21

SEMESTER III			
No	Kode	Course	SKS
1	PNB 2111	The basics of Genetics	2/1
2	BDU 2106	English	2/0
3	PNT 2122	Basic climatology	2/1
4	PNH 2110	Basics of Plant Protection	2/0
5	PNU 2102	Biochemistry	2/0
6	PNU 2102P	Biochemistry Practicum	0/1
7	PNP2100	Dasar-Dasar Agricultural Counseling and	2/1
8	PNB 2141	Experimental Design	2/1
9	PNE 2153	Agricultural Business Management	2/0
	SUM		21

SEMESTER IV			
No	Kode	Course	SKS
1	PNB 2221	Basics of Plant Breeding	2/1
2	PNA 2200	Basics of Plant Physiology	2/1
3	PNH 2220	Basics of Plant Pest Science	2/1
4	PNH 2230	Basics of Plant Disease	2/1
5	PNU 2203	Introduction to Agricultural Biotechnology	2/0
6	PNE 2254	**Entrepreneurship**	2/0
7	PNB 2231	Seed Technology	2/1
8		Elective course	
	SUM		19-24

SEMESTER V			
No	Kode	Course	SKS
1	UNU 310X	Pendidikan Agama	2/0
2	PNA 3144	Cultivation of Seasonal Crops	2/1
3	PNT 3115	Fertilization and Soil Fertility Tanah	2/1
4	PNB 3121	Plant Breeding Method	2/1
5	PNB 3114	Molecular Genetics	2/0
6	PNU 3104	Research Method	2/0
7		Elective course	7
	SUM		16-24

SEMESTER VI			
No	Kode	Course	SKS
1	PNT 3225	Agricultural Water Management	2/1
2	PNU 3205	Regional Planning and Development 3/0	
3	PNA 3248	Annual Crop Cultivation	2/1
4	PNB 3080	Field Work*)	0/2
5	PNB 3222	Introduction to Biotechnology for Plant Breeding	2/0
6	PNB 3213	Introduction to Quantitative Genetics	2/0
		Elective course	
	SUM		15-24

SEMESTER VII				SEMESTER VIII			
No	Code	Course	SCU	No	Code	Course	SCU
1	UNU 4050	Community Service Program*)	0/3	1	UNU 4050	Community Service Program*)	0/3
2	PNB 4085	Seminar*)	0/1	2	PNB 4085	Seminar*)	0/1
3	PNB 4090	Thesis*)	4-6	3	PNB 4090	Thesis*)	4-6
4		Elective course		4		Elective course	
SUM			8-24	SUM			8-24

***) can be taken either in odd or even semester**

ELECTIVE COURSE			
No	Code	Course	SCU
1	PNB 3233	Seeding Management	2/0
2	PNB 3132	Seed Physiology	2/1
3		Courses in other Study Program	

Curriculum for Concentration of Seed Technology Studies (for students class of before 2014)

SEMESTER I			
No	Kode	Course	SKS
1	UNU 1100	Pancasila	2/0
2	BDU 1105	Indonesian Language	2/0
3	MFS 1100	Basic Physics	2/0
4	MFS 1100P	Basic Physics Practicum	0/1
5	MKS 1100	Inorganic Chemistry	2/0
6	MKS 1100P	Inorganic Chemistry Practicum	0/1
7	BIO 1101	General Biology	2/1
8	MMS 1101	Mathematics	3/0
9	PNU 1101	Introduction to Agricultural Science	2/0
10	PNE 1151	Management Basics	2/0
		SUM	20

SEMESTER II			
No	Kode	Course	SKS
1	UNU 1200	Civic Education	2/0
2	PNA 1240	Agronomy Basics	2/1
3	PNT 1201	Soil Science Basics	2/1
4	PNA 1220	Ecology Basics	2/1
5	MKS 1201	Organic Chemistry	2/0
6	MKS 1201P	Organic Chemistry Practicum	0/1
7	PNP 1201	Agricultural Sociology	2/0
8	PNB 1241	Statistic	2/0
9	PNB 1241P	Statistic Practicum	0/1
10	PNE 1221	Agricultural economy	2/0
		SUM	21

SEMESTER III			
No	Kode	Course	SKS
1	PNB 2111	The basics of Genetics	2/1
2	BDU 2106	English	2/0
3	PNT 2122	Basic climatology	2/1
4	PNH 2110	Basics of Plant Protection	2/0
5	PNU 2102	Biochemistry	2/0
6	PNU 2102P	Biochemistry Practicum	0/1
7	PNP 2100	Basics of Agricultural Counseling and	2/1
8	PNB 2141	Experimental Design	2/1
9	PNE 2153	Agricultural Business Management	2/0
		SUM	21

SEMESTER IV			
No	Kode	Course	SKS
1	PNB 2221	Basics of Plant Breeding	2/1
2	PNA 2200	Basics of Plant Physiology	2/1
3	PNH 2220	Basics of Plant Pests	2/1
4	PNH 2230	Basics of Plant Disease	2/1
5	PNU 2203	Introduction to Agricultural Biotechnology	2/0
6	PNE 2254	**Entrepreneurship**	2/0
7	PNB 2231	Seed Technology	2/1
8		Elective course	
		SUM	19-24

SEMESTER V			
No	Kode	Course	SKS
1	UNU 310X	Pendidikan Agama	2/0
2	PNA 3144	Cultivation of Seasonal Crops	2/1
3	PNT 3115	Fertilization and Soil Fertility Tanah	2/1
4	PNB 3132	Seed Physiology	2/1
5	PNU 3104	Research Method	2/0
6	PNB 3105	Plant Breeding Method	2/1
7		Elective course	
		SUM	14-24

SEMESTER VI			
No	Kode	Course	SKS
1	PNT 3225	Agricultural Water Management	2/1
2	PNU 3205	Regional Planning and Development	3/0
3	PNA 3248	Annual Crop Cultivation	2/1
4	PNB 3080	Field Work*)	0/2
5	PNB 3233	Seeding Management	2/0
6		Elective course	
		SUM	13-24

SEMESTER VII			
No	**Kode**	**Course**	**SKS**
1	UNU 4050	Community Service Program*)	0/3
2	PNB 4085	Seminar*)	0/1
3	PNB 4090	Thesis*)	4-6
4		Elective course	
	SUM		**8-24**

SEMESTER VIII			
No	**Kode**	**Course**	**SKS**
1	UNU 4050	Community Service Program*)	0/3
2	PNB 4085	Seminar*)	0/1
3	PNB 4090	Thesis*)	4-6
4		Elective course	
	SUM		**8-24**

***) can be taken either in odd or even semester**

ELECTIVE COURSE			
No	**Kode**	**Course**	**SCU**
1	PNB 3222	Introduction to Biotechnology for Plant	2/0
2	PNB 3213	Introduction to Quantitative Genetics	2/0
3	PNB 3114	Molecular Genetics	2/0
4		Courses in other Study Program within	2/0

2. Department of Plant Protection

2.1. Plant Protection Study Program Vision

To become a study program with international quality, which is competitive and able to innovatively solve the problem of plant protection by mastering and developing science and technology

Missions

1. To administer higher education in the field of plant protection to produce Human Resources that are able to identify problems and find solutions based on the principles of Integrated Pest and Disease Management (IPM).
2. To carry out research to support education and community service in the field of plant protection in order to support the sustainable agricultural system.
3. To develop the concept and technology as the reference (trendsetter) of decision making in plant protection.
4. To develop the department dynamically.

Undergraduates profiles

Undergraduate of Plant Pest and Disease Study program must acquire the following profiles:

1. Actors in the field of agricultures
2. Manager (*planner, designer, organizer, evaluator, mediator*)
3. Entrepreneur (*entrepreneur, initiator, adaptor, cooperator*)
4. Researches, and
5. Educator

Undergraduates Competences

Undergraduates of Plant Pest and Disease Study Program must have the following competences:

1. Profile Competence (1) as the actor of agricultures

a. having the ability to apply the science and technology of Plant Pest and Disease in the field of sustainable agriculture based on modern principles that promote local wisdom

b. having the ability to communicate in order to meet the needs of the community.

2. Profile Competence (2) as Manager (*planner, designer, organizer, evaluator, mediator*):

a. having the ability to effectively and productively plan and design plant protection systems

b. having the ability to carry out plant protection system planning appropriately according to the rules of sustainable agriculture

c. having the ability to evaluate and assess the process of crop protection and post-harvest

d. having the ability to actualize their potential for cooperative work in multidisciplinary teams.

1. Competence (3) as Businessperson (entrepreneur, initiator, adaptor, cooperator):

a. having the courage to initiate, implement and develop the innovative efforts in the field of plant protection in sustainable agriculture
b. having the ability to collaborate (to negotiate and communicate) effectively
c. having the ability to innovate in applying the science and technology in the field of agricultural protection to business practice
d. having the ability to apply the agricultural business ethics with environmental insight.

2. Competence (4) as Researcher:
a. having the ability to identify, analysis and formulate problems accurately on sustainable plant protection system in agriculture
b. having the ability to design and implement a research as well as to interpret data professionally
c. having the ability to recommend accurate solution to a problem of plant protection within a sustainable agricultural cultivation system.

3. Competencies (5) educators (facilitators, motivators and mediators):
a. having the lifelong learning ability in the field of Pest and Growth Disease
b. having the ability to think analytically and synthetically by calculating the impact of problem solving to life on global scale
c. having the ability as systematic and effective facilitator, motivator and mediator.

Curriculum

SEMESTER I			
No	**Kode**	**Course**	**SKS**
1	UNU 1100	Pancasila	2/0
2	BDU 1105	Indonesian Language	2/0
3	MFS 1100	Basic Physics	2/0
4	MFS 1100P	Basic Physics Practicum	0/1
5	MKS 1100	Inorganic Chemistry	2/0
6	MKS 1100P	Inorganic Chemistry Practicum	0/1
7	BIO 1101	General Biology	2/1
8	MMS 1101	Mathematics	3/0
9	PNU 1101	Introduction to Agricultural Science	2/0
10	PNE 1151	Management Basics	2/0
		SUM	20

SEMESTER II			
No	**Kode**	**Course**	**SKS**
1	UNU 1200	Civic Education	2/0
2	PNA 1240	Agronomy Basics	2/1
3	PNT 1201	Soil Science Basics	2/1
4	PNA 1220	Ecology Basics	2/1
5	MKS 1201	Organic Chemistry	2/0
6	MKS 1201P	Organic Chemistry Practicum	0/1
7	PNP 1201	Agricultural Sociology	2/0
8	PNB 1241	Statistic	2/0
9	PNB 1241P	Statistic Practicum	0/1
10	PNE 1221	Agricultural economy	2/0
		SUM	21

SEMESTER III			
No	**Kode**	**Course**	**SKS**
1	PNB 2111	The basics of Genetics	2/1
2	BDU 2106	English	2/0
3	PNT 2122	Basic climatology	2/1
4	PNH 2110	Basics of Plant Protection	2/0
5	PNU 2102	Biochemistry	2/0
6	PNU 2102P	Biochemistry Practicum	0/1
7	PNP 2100	Basics of Agricultural Counseling and Communication	2/1
8	PNB 2141	Experimental Design	2/1
9	PNE 2153	Agricultural Business Management	2/0
	SUM		**21**

SEMESTER IV			
No	**Kode**	**Course**	**SKS**
1	PNB 2221	Basics of Plant Breeding	2/1
2	PNA 2200	Basics of Plant Physiology	2/1
3	PNH 2220	Basics of Plant Pest Science	2/1
4	PNH 2230	Basics of Plant Disease Science	2/1
5	PNU 2203	Introduction to Agricultural Biotechnology	2/0
6	PNE 2254	**Entrepreneurship**	2/0
7	PNA 2256	Weed Science	2/1
8		Elective course	0-5
	SUM		**19-24**

SEMESTER V			
No	**Kode**	**Course**	**SKS**
1	UNU 310X	Pendidikan Agama	2/0
2	PNA 3144	Cultivation of Seasonal Crops	2/1
3	PNT 3115	Fertility, Fertilization and Soil Health	2/1
4	PNU 3104	Research Method	2/0
5	PNH 3150	Plant Pathogens	2/1
6	PNH 3140	Plant Pest Identification	2/1
7	PNH 3160	Plant Ecology	2/1
8		Elective course	
	SUM		**19-24**

SEMESTER VI			
No	**Kode**	**Course**	**SKS**
1	PNT 3225	Agricultural Water Management	2/1
2	PNU 3205	Regional Planning and Development	3/0
3	PNA 3248	Annual Crop Cultivation	2/1
4	PNH 3080	Field Work*)	0/2
5	PNH 3280	Management of Plant Pests and Diseases	2/1
6	PNH 3290	Management of Post Harvest Pests and Diseases	2/1
7	PNH 3270	Plant Protection Policy	2/0
8		Elective course	
	SUM		**19-24**

SEMESTER VII			
No	**Kode**	**Course**	**SKS**
1	UNU 4050	Community Service Program*)	0/3
2	PNH 4085	Seminar*)	0/1
3	PNH 4090	Thesis*)	4-6
4		Elective course	
		SUM	**8-24**

SEMESTER VIII			
No	**Kode**	**Course**	**SKS**
1	UNU 4050	Community Service	0/3
2	PNH 4085	Program*)	0/1
3	PNH 4090	Seminar*)	4-6
4		Thesis*)	
		Elective course	**8-24**

***) can be taken either in odd or even semester**

ELECTIVE COURSE			
Odd semester			
No	Kode	Course	SKS
1	PNH 3162	Plant Disease Observation Techniques	2/1
2	PNH 3163	Plant Quarantine	2/0
3	PNH 3165	Special issues of Plant Pest and Disease	0/1
4	PNH 3161	Plant Protection Biotechnology	2/0
5	PNH 3141	Basic Entomology	2/1
6	PNH 3164	Plant Clinic	0/1
7	PNH 3142	Vertebrata Hama	1/1
8	PNH 3152	Seed Pathology	1/1
9	PNH 3151	Plant Parasitic Nematode Biology	1/1
10	PNH 3153	Introduction to the Epidemology of Plant	1/1

ELECTIVE COURSE			
Even semester			
No	Kode	Course	SKS
1	PNH 3273	Apiologi	1/1
2	PNH 3291	Biological Control	2/1
3	PNH 3271	Basics of Insect Pathology	1/1
4	PNH 3281	Agricultural Nematology 1/1	
5	PNH 3282	Introduction to Agricultural Mycology	1/1
6	PNH 3283	Introduction to Plant Pathogen Prokaryotes	1/1
7	PNH 3284	Introduction to Plant Virology	1/1
8	PNH 3272	Akarologi	1/1
9	PNH 3274	Insect Mass Breeding	1/1
10	PNH 3292	Agricultural Pesticides	2/1

3. DEPARTMENT OF FISHERIES

3.1. Aquaculture Study Program

Vision

To become a study program that is able to compete at the national and international level, develop Aquaculture science and technology, and produce professional, moral, and high-competent graduates in the Aquaculture field to improve the welfare of the community.

Mission

a. To develop a productive, accountable, quality, and efficient education to produce graduates who are professional and competent in the field of Aquaculture and fisheries entrepreneurs.
b. To increase research advances to improve the quality of education and advances in science and technology to advance productive, quality, efficient, economic, competitive, responsible, and sustainable Aquaculture.
c. To promote the application of science and technology/research results through community service, especially those related to Aquaculture based on great social responsibility.
d. To establish cooperation with alumni and related institutions from within and outside the country

in the context of implementing Tridharma of higher education.

Main Competence:

Bachelor of Fisheries who is able to apply, develop technology and management of Aquaculture that is productive, efficient, and sustainable in the fisheries business system.

Supporting Competency:

a. bachelor of fishery graduates who master the basics of fisheries science and technology.
b. bachelor of fishery graduates who master the basics of science and technology in Fisheries Resource Management.
c. bachelor of fishery graduates who master the basics of technology and management of fishery product processing.

Other Competency:

a. bachelor of fishery graduates who have a national spirit, leadership entrepreneurship, moral, and able to communicate effectively.
b. bachelor of fishery graduates who have independence in improving and developing competencies.

Curriculum

SEMESTER I			
N0.	**Kode**	**Course**	**SKS**
1	UNU 1100	Pancasila	2/0
2	BDU 1105	Indonesian Language	2/0
3	MFS 1100	Basic Physics	2/0
4	MFS 1100P	Basic Physics Practicum	0/1
5	MKS 1100	Inorganic Chemistry	2/0
6	MKS 1100P	Inorganic Chemistry Practicum	0/1
7	MMS 1101	Mathematics	3/0
8	PNE 1151	Management Basics	2/0
9	PIB 1151	Aquatic Invertebrates	2/1
10	PIU 1101	Introduction to Fisheries and Marine Sciences	2/0
	SUM		**20**

SEMESTER II			
N0.	**Kode**	**Course**	**SKS**
1	UNU 1200	Civic Education	2/0
2	MKS 1201	Organic Chemistry	2/0
3	MKS 1201P	Organic Chemistry Practicum	0/1
4	PNB 1241	Statistic	2/0
5	PNB 1241P	Statistic Practicum	0/1
6	PIM 1221	Basics of Fishing	2/0
7	PIB 1252	Iktiologi	2/1
8	PIM 1231	Fishery Sociology	2/0
9	PIT 1221	Microbiology	2/1
10	PIM 1211	Aquatic Ecology	2/1
	SUM		**21**

SEMESTER III			
No	**Kode**	**Course**	**SKS**
1	BDU 2106	English	2/0
2	PNU 2102	Biochemistry	2/0
3	PNU 2102P	Biochemistry Practicum	0/1
4	PNB 2141	Experimental Design	2/1
5	PIB 2154	Marine Biology	2/1
6	PIT 2111	Fish Technology Basics	2/0
7	PIM 2122	Fisheries Biology	2/1
8	PIM 2112	Limnology	2/1
9	PIB 2114	Soil and Fisheries Irrigation	2/0
	SUM		**21**

SEMESTER IV			
No	**Kode**	**Course**	**SKS**
1	PIM 2232	Introduction to Fisheries Economics	2/1
2	PIB 2244	Introduction to Fishery Biotechnology	2/0
3	PIB 2211	Aquaculture Basics	2/0
4	PNE 2254	**Entrepreneurship**	2/0
5	PIB 2241	The basics of Genetics	2/1
6	PIB 2253	Physiology of Aquatic Animals	2/1
7	PIM 2113	Oceanographic	2/1
8	PIB 2231	Fish Feed Nutrition and Management	2/1
	SUM		**21**

SEMESTER V			
No	**Kode**	**Course**	**SKS**
1	UNU 310X	Pendidikan Agama	2/0
2	PNU 3104	Research Method	2/0
3	PNP 2100	Basics of Agricultural Counseling and Communication	2/1
4	PIB 3142	Genetics and Fish Breeding	2/1
5	PIB 3115	Freshwater Aquaculture Management	2/1
6	PIB 3121	Fish parasites and diseases	2/1
7	PIB 3133	Natural Feed Cultivation	1/1
8	PIB 3113	Water Quality Management	2/1
	SUM		**21**

SEMESTER VI			
No	**Kode**	**Course**	**SKS**
1	PIM 3237	Fisheries Business Planning	2/0
2	PIM 3235	Fisheries Agribusiness Management	2/0
3	PIB 3212	Aquaculture Engineering	2/1
4	PIB 3216	Brackish Aquaculture Management	2/1
5	PIB 3217	Mariculture Management	2/1
6	PIB 3222	Fish Health Management	2/1
7	PIB 3080	Field Work*)	0/2
		Elective course	4
	SUM		**18-24**

SEMESTER VII			
No	**Kode**	**Course**	**SKS**
1	PIB 4085	Seminar *)	0/1
2	PIB 4090	Thesis *)	0/6
3	UNU 4050	Community Service Program*)	0/3
4	PIB 4413	Technology and Seeding Management	2/1
5		Elective course	
		SUM	**13-24**

SEMESTER VIII			
No	**Kode**	**Course**	**SKS**
1	PIB 4085	Seminar *)	0/1
2	PIB 4090	Thesis *)	0/6
3	UNU 4050	Community Service Program*)	0/3
4		Elective course	
		SUM	**10-24**

***) Can be taken either in odd or even semester**

ELECTIVE COURSE			
		Odd semester	
No	**Kode**	**Course**	**SKS**
1	PIB 4118	Ornamental Fish and Aquatic Landscape	1/1
2	PIB 4156	Histology	1/1
3	PIM 2123	Introduction to Geographic Information	2/0
4	PIT 3125	Fishery Product Quality Control	2/0
5	PIM 4115	Aquatic Pollution Control	2/0
6	PNM 4164	Introduction to Biodegradation and	2/0
7	PIM 3133	Fishery Data Processing	2/1
8	PNE 2153	Agricultural Business Management	2/0
9		Course PS in UGM	

ELECTIVE COURSE			
Even semester			
No	Kode	Course	SKS
1	PIM 3245	ENVIRONMENTAL IMPACT ANALYSIS	2/0
2	PIM 3244	Fisheries Development	2/0
3	PIB 4219	Management of Aquaculture Circles	2/0
4	PNM 3252	Biological safety	2/0
5	PIB 3256	Plankton and Aquatic Plants	2/0
6		Course PS di UGM	

3.2. Aquatic Resource Management Study Program

Vision

To Become a study program that is able to compete at national and international levels by carrying out programs to advance science and technology in Fisheries Resource Management to produce graduates who are competent in their fields and moral.

Mission

a. To administer quality fisheries education in order to participate in educating and building and maintaining the integrity of the nation.
b. To develop knowledge and technology of Fisheries Resource Management that is sustainable and responsible through the development of education, research, and community empowerment
c. to produce graduates who have high competence in the field of Fisheries Resource Management, being resilient, superior, with noble moral, and able to compete at the national and international levels while still basing themselves on the national identity.
d. to establish cooperation in the development of science and technology with other tertiary institutions, government, business and industry and other institutions both national and abroad
e. to improve the quality of organizational management continuously to support activities and services.

Competency

Graduates of the Fisheries Resource Management Study Program have competencies:
1. having the moral, cultured, and being nationally capable of managing fisheries resources sustainably for the welfare of the people
2. Behaving honestly, venture for critics and obey norms of the truth.
3. Mastering and able to implement the principles of management (exploration, exploitation, conservation, rehabilitation and diversification) of fisheries resources.
4. Able to perform environmental analysis of the waters
5. Able to calculate and analyze the economic value of fisheries resources
6. Able to carry out socio-economic analysis of fisheries
7. Able to communicate and disseminate science and technology in effective manner both verbally and in writing
8. Able to work individually and cooperate in group

9. Able to access and synthesize information

Curriculum

SEMESTER I			
No	**Kode**	**Course**	**SKS**
1	UNU 1100	Pancasila	2/0
2	BDU 1105	Indonesian Language	2/0
3	MFS 1100	Basic Physics	2/0
4	MFS 1100P	Basic Physics Practicum	0/1
5	MKS 1100	Inorganic Chemistry	2/0
6	MKS 1100P	Inorganic Chemistry Practicum	0/1
7	MMS 1100	Mathematics	3/0
8	PNE 1151	Management Basics	2/0
9	PIB 1151	Aquatic Invertebrata	2/1
10	PIU 1101	Introduction to Fisheries and marine science	2/0
		SUM	**20**

SEMESTER II			
No	**Kode**	**Course**	**SKS**
1	UNU 1200	Civic Education	2/0
2	MKS 1201	Organic Chemistry	2/0
3	MKS 1201P	Organic Chemistry Practicum	0/1
4	PNB 1241	Statistic	2/0
5	PNB 1241P	Statistic Practicum	0/1
6	PIM 1221	Basics of Fishing	2/0
7	PIB 1252	Iktiologi	2/1
8	PIM 1231	Fishery Sociology	2/0
9	PIT 1221	Microbiology	2/1
10	PIM 1211	Aquatic Ecology	2/1
		SUM	**21**

SEMESTER III			
No	**Kode**	**Course**	**SCU**
1	BDU 2106	English	2/0
2	PNU 2102	Biochemistry	2/0
3	PNU 2102P	Biochemistry Practicum	0/1
4	PNB 2141	Experimental Design	2/1
5	PIB 2154	Marine Biology	2/1
6	PIT 2111	Fish Technology Basics	2/0
7	PIM 2122	Fisheries Biology	2/1
8	PIM 2112	Limnology	2/1
SEMESTER IV			
		SUM	**21**

No	Kode	Course	SKS
1	PIM 2232	Introduction to Fisheries Economics	2/1
2	PIB 2244	Introduction to Fisheries Biotech	2/0
3	PIB 2211	Aquaculture Basics	2/0
4	PNE 2254	**Entrepreneurship**	2/0
5	PIB 2241	The basics of Genetics	2/1
6	PIB 2253	Physiology of Aquatic Animals	2/1
7	PIM 2213	Oceanographic	2/1
8	PIM 2224	Fish Population Dynamics	2/1
		Elective course	
		SUM	**21-24**

SEMESTER V			
No	Kode	Course	SKS
1	UNU 310X	Pendidikan Agama	2/0
	PNU 3104	Research Method	2/0
2	PNP 2100	Basics of Agricultural Counseling and	2/1
3	PIM 3133	Fishery Data Processing	2/1
4	PIM 3125	Fishing Techniques	2/1
5	PIM 3141	Water Resource Management	2/1
6	PIM 3134	Fisheries Business Feasibility Study	2/0
7	PIM 3114	Aquatic Ecotoxicology	2/1
		Elective course	
		SUM	**18-24**

SEMESTER VI			
No	Kode	Course	SKS
1	PIM 3235	Fisheries Agribusiness Management	2/0
	PIM 3236	Fisheries Resource Economics	2/0
2	PIM 3237	Fisheries Business Planning	2/0
3	PIM 3242	Fisheries Resource Management	2/1
4	PIM 3243	Fisheries Resources Conservation	2/1
5	PIM 3244	Fisheries Development	2/0
6	PIM 3245	ENVIRONMENTAL IMPACT ANALYSIS	2/0
7	PIM 3080	Field Work*)	0/2
8		Elective course	
		SUM	**18-24**

SEMESTER VII			
No	Kode	Course	SKS
1	PIM 4085	Seminar *)	0/1
2	PIM 4090	Thesis *)	0/6
3	UNU 4050	Community Service Program*)	0/3
4		Elective course	
		SUM	**10-24**

SEMESTER VIII			
No	Kode	Course	SKS
1	PIM 4085	Seminar *)	0/1
2	PIM 4090	Thesis *)	0/6
3	UNU 4050	Community Service Program*)	0/3
4		Elective course	
		SUM	**10-24**

***) can be taken either in odd or even semester**

ELECTIVE COURSE			
Odd semester			
No	**Kode**	**Course**	**SKS**
1	PIM 4115	Aquatic Pollution Control	2/0
2	PIM 3126	Fishing Materials and Equipment	2/0
3	PIM 4138	Fishery Product Trade Administration	2/0
4	PIM 3146	Iktioplankton	2/0
5	PNE 2153	Agricultural Business Management	2/0
6	PNM 4164	Introduction to Biodegradation and Bioremediation	2/0
7	PIT 3115	Fishery Product Handling	2/1
8	KTK 421	Watershed Management	2/0
9	PNT 2122	Basic climatology	2/1
10		Courses in other Study Program within UGM	
		Soft skill, non SCU but Compulsory	

ELECTIVE COURSE			
		Even semester	
No	**Kode**	**Course**	**SKS**
1	PIB 4219	Aquaculture Environmental Management	2/0
2	PNM 3252	Biological safety	2/0
3	PIM 3227	Instrumentation and Navigation	2/0
4	PNE 3216	Water Resources and Environmental Economics	3/0
5	PIT 3219	Fisheries Industry Management	2/1
6	BIO 3033	Biogeography	2/0
		Courses in other Study Program within UGM	

3.2. Fishery Product Technology Study Program

Vision

To become a study program that is able to produce graduates who are reliable, high quality in science and Fishery Product Technology, virtuous, with high integrity, love the country , and acknowledged by the public.

Mission

a. To organize quality fisheries education in order to participate in education and development as the participation to the intellectual life of the nation.

b. To produce graduates who are resilient, superior, virtuous, and able to compete at the international level while still basing themselves on national identity.

c. To increase the progress of researchers who support education and advancement of science, technology handling and processing of fishery products in the context of utilizing fish and marine resources in an optimal, sustainable, and beneficial manner.

d. To carry out community service based on social responsibility.

e. To establish cooperation with other educational institutions, business, and industry.

f. To continually improve the quality of management to support activities and services.

Graduates Profile

1. Fishery Product Developer who is able to apply the principles of handling and processing fishery product, to plan the activities of the fishery products industry and has the techno-preuneurship.
2. Reviewer who is able to identify, analyze and formulate solutions for post-harvest fishery products.
3. Manager who has management and leadership knowledge in the fishery product processing industry
4. Academician who is able to communicate ideas and knowledge in the field of post-harvest fishery products both written and written and has the sensitivity and responsibility to disseminate the knowledge.

Graduates Competency

A Bachelor of Fisheries who is able to:

1. Have the moral scholar of fishery (pious), cultured (loyal personality), and nationality capable of managing fisheries resources sustainably for the welfare of the people independently and innovatively (KU-1)
2. have the knowledge and understanding in implementing and disseminating post-harvest fisheries science and technology (KU-2)
3. Plan, implement, and develop an environmentally sound post-harvest fishery industry and business (KU-3)
4. Plan, implement, and disseminate quality management principles to produce highly competitive fishery products (KU-4)
5. Follow the development and dissemination of the latest post-harvest fisheries science and technology (KU-6)

Supporting Competency

A Bachelor of Fisheries who is able to:

1. Master the success skills (communicating, negotiating, and problem solving, as well as utilizing

information technology and communication effectively and others) (KP-1)
2. Understand the laws and regulations related to the fisheries and marine industry (KP-2)
3. Understand the trading system of fisheries commodities (KP-3)
4. Master the basics of science and technology in fisheries resource management (KP-4)
5. Master the basics of Aquaculture science and technology (KP-5)

Other Competencies

A Bachelor of Fisheries who is able to understand the management principles (KL-1).

Curriculum

SEMESTER I			
No.	**Kode**	**Course**	**SKS**
1	UNU 1100	Pancasila	2/0
2	BDU 1105	Indonesian Language	2/0
3	MFS 1100	Basic Physics	2/0
4	MFS 1100P	Basic Physics Practicum	0/1
5	MKS 1100	Inorganic Chemistry	2/0
6	MKS 1100P	Inorganic Chemistry Practicum	0/1
7	MMS 1101	Mathematics	3/0
8	PNE 1151	Management Basics	2/0
9	PIB 1151	Aquatic Invertebrata	2/1
10	PIU 1101	Introduction to Fisheries and Marine Sciences	2/0
		SUM	**20**

SEMESTER II			
No.	**Kode**	**Course**	**SKS**
1	UNU 1200	Civic Education	2/0
2	MKS 1201	Organic Chemistry	2/0
3	MKS1201P	Organic Chemistry Practicum	0/1
4	PNB 1241	Statistic	2/0
5	PNB 1241P	Statistic Practicum	0/1
6	PIM 1221	Basics of Fishing	2/0
7	PIB 1252	Iktiologi	2/1
8	PIM 1231	Fishery Sociology	2/0
9	PIT 1221	Microbiology	2/1
10	PIM 1211	Aquatic Ecology	2/1
		SUM	**21**

SEMESTER III			
No	**Kode**	**Course**	**SKS**
1	BDU 2106	English	2/0
2	PNU 2102	Biochemistry	2/0
3	PNU 2102P	Biochemistry Practicum	0/1
4	PNB 2141	Experimental Design	2/1
5	PIB 2154	Marine Biology	2/1
6	PIT 2111	Basics of Fish Technology	2/0
7	PIM 2122	Fisheries Biology	2/1
8	PIT 2123	Fishery Nutrition	2/0
9	PIT 2112	Refrigeration of Fishery Products	2/1
		SUM	**21**

SEMESTER IV			
No	**Kode**	**Course**	**SKS**
1	PIM 2232	Introduction to Fisheries Economics	2/1
2	PIB 2244	Introduction to Fishery Biotechnology	2/0
3	PIB 2211	Aquaculture Basics	2/0
4	PNE 2254	**Entrepreneurship**	2/0
5	PIB 2241	The basics of Genetics	2/1
6	PIT 2223	Chemical and Biochemistry of Fisheries	2/1
7	PIT 2212	Thermal Process of Fishery Products	2/1
8	PIT 2213	Food Analysis	2/1
		Elective course	
		SUM	**21-24**

SEMESTER V			
No	**Kode**	**Course**	**SKS**
1	UNU 310X	Pendidikan Agama	2/0
2	PNU 3104	Research Method	2/0
3	PNP 2100	Basics of Agricultural Counseling and Communication	2/1
4	PIM 3133	Fishery Data Processing	2/1
5	PIT 3115	Fishery Product Handling	2/1
6	PIT 3124	Microbiology of Fishery Products	2/1
7	PIT 3125	Fishery Product Quality Control	2/0
8	PIT 3116	Material Layout and Handling	2/0
9		Elective course	
		SUM	**20-24**

SEMESTER VI			
No	**Kode**	**Course S**	**KS**
1	PIM 3235	Fisheries Agribusiness Management	2/0
2	PIM 3237	Fisheries Business Planning	2/0
3	PIT 3217	Fishery Product Processing	2/1
4	PIT 3219	Fisheries Industry Management	2/1
5	PIT 3218	Fisheries Product Quality Testing Techniques	0/2
6	PIT 3226	Fisheries Industry Waste Management	2/1
7	PIT 3080	Field Work*)	0/2
8		Elective course	
	SUM		**17-24**

SEMESTER VII			
No	Kode	Course	SKS
1	PIT 4085	Seminar *)	0/1
2	PIT 4090	Thesis *)	0/6
3	UNU 4050	Community Service Program*)	0/3
4		Elective course	
		SUM	10-24

SEMESTER VIII			
No	Kode	Course	SCU
1	PIT 4085	Seminar *)	0/1
2	PIT 4090	Thesis *)	0/6
3	UNU 4050	Community Service Program *)	0/3
4		Elective course	
		SUM	10-24

ELECTIVE COURSE			
Odd semester			
No	Kode	Course	SKS
1	PIM 3134	Fisheries Business Feasibility Study	2/0
2	TPP 3314	Sanitation and Food Safety	2/0
3	TPP 4319	Fermentation Technology	2/0
4	TPP 4309	Practicum of Fermentation Process and Technology	0/1
5	PNM 2231	Introduction to Enzymology	2/0
6	TPP 3718	Processing Equipment and Machines	2/0
7	PIM 4138	Fishery Product Trade Administration	2/0
8	TPP 3715	Preservation and Packaging Technology	2/0
9	PIT 4128	Capita Selekta	2/0
10	TPI 3101	Marketing	2/0
11		Courses in other Study Program within UGM Soft skill, non SCY, compulsory	

ELECTIVE COURSE			
Even semester			
No	Kode	Course	SKS
1	PIT 4227	Toxicology and Hygiene	2/0
2	TPP 3115	Food Service Industry	2/0
3	PNM 3233	Introduction to Enzyme Technology	2/0
4	TPI 2004	Knowledge of Agricultural Industrial Materials	
5	TPP 4824	Quality management	2/0
6	PIM 3244	Fisheries Development	2/0
7	HKU 4186	Consumer Protection Law	2/0
8	PNM 3252	Biological safety	2/0
9		Courses in other Study Program within UGM	

4. DEPARTMENT OF SOCIAL AGRICULTURAL ECONOMICS

4.1. Agriculture & Agribusiness Economics Study Program

The Agricultural/Agribusiness Economics Study Program consists of two study concentrations: Agricultural Economics Study Concentration and Agribusiness Study Concentration.

Vision

To become a national and international superior study program in producing highly competitive human resources; developing, creating science and engineering in agricultural/agribusiness economics; and apply it to improve community welfare.

Mission

1. To administer research-based education to produce graduates who are competent in applying, developing, and disseminating agricultural/agribusiness science and engineering economics.
2. to develop sustainable strategic researchers to support the development of agricultural/agribusiness science and engineering economics.
3. to provide services to the community with community-oriented programs for empowerment and improvement of community welfare.
4. to develop study programs that are responsive to the development of science, government policies, and the needs of the national and international community.

Objectives

1. Education. Agriculture Socio-Economy/Agribusiness aims to produce: Graduates who:

(1) master scientific thinking, have the ability to conduct researchers, and have skills in agricultural/agribusiness economics;

(2) are able to use their knowledge and skills as the provisions to work and solve problems to cope by the community; and

(3) are able to follow the development of science and engineering of agricultural/agribusiness economics, both nationally and internationally;

2. Researcher. Agriculture Socio-Economy/Agribusiness aims to produce: Agricultural / agribusiness economic science and engineering that is in accordance with the needs of local, national and international communities;

3. Community service and service. Agriculture Socio-Economy/Agribusiness aims to produce:

a. Community service models and agricultural development by applying agricultural/agribusiness economic and engineering knowledge to improve community welfare;

b. Quality service and community service in the field of agricultural/agribusiness economics through training, consultation, and analysis.

Graduate Profiles

1. Agribusiness and agricultural economics experts
2. Formulating agribusiness and agricultural economic policies
3. Agribusiness entrepreneurs
4. Facilitator of agribusiness development and agricultural development
5. International standard researchers / developers

Graduates competence based on the Profiles:

1. Agribusiness and Agricultural Economics Experts, having the ability:

a. to design efficient allocation of natural, human, capital and social resources to support sustainable food and energy security

b. to work in multidisciplinary teams.

c. to vary out environmentally sound scientific ethics in the field of agribusiness and agricultural economics that is.
d. To perform a leadership spirit.

2. Formulator of Agribusiness Policy and Agricultural Economics

a. Having the ability to carry out analytical and synthetical thinking in evaluating and providing the development solutions to agribusiness operating systems and agricultural development.
b. Having the ability to formulate policies based on scientific principles.
c. Having the ability to disseminate agribusiness and agricultural economic policies effectively to stakeholders.

3. Agribusiness Entrepreneur
   a. having the ability to design the operation and development of an innovative agribusiness business unit, create added value, and be environmentally friendly.
   b. having the ability to identify, change and manage risks to the agribusiness operating system.
   c. comprehending business ethics that is environmentally friendly
   d. Having a leadership spirit and being able to make business decisions.

4. Agribusiness Development and Agricultural Development Agencies
   a. Having the sensitivity to social and economic problems related to agribusiness development and agricultural development.
   b. Having the ability to formulate strategies and policies and use methods and resources to face the challenges of agribusiness development and agricultural development in the future.
   c. Having the ability to negotiate and communicate effectively with stakeholders in the development of agribusiness and agricultural development by utilizing the development of information technology.

4. Researchers / Developers of International Science
   a. Having the ability to master theories and analytical tools.
   b. Having independence in the learning process and being able to speak international.

Curriculum of Agricultural Economic Studies Concentration

SEMESTER I			
No	**Kode**	**Course**	**SKS**
1	UNU 1100	Pancasila	2/0
2	BDU 1105	Indonesian Language	2/0
3	MFS 1100	Basic Physics	2/0
4	MFS 1100P	Basic Physics Practicum	0/1
5	MKS 1100	Inorganic Chemistry	2/0
6	MKS 1100P	Inorganic Chemistry Practicum	0/1
7	BIO 1101	General Biology	2/1
8	MMS 1101	Mathematics	3/0
9	PNU 1101	Introduction to Agricultural Science	2/0
10	PNE 1151	Management Basics	2/0
		SUM	**20**

SEMESTER II			
No	**Kode**	**Course**	**SKS**
1	UNU 1200	Civic Education	2/0
2	PNA 1240	Agronomy Basics	2/1
3	PNT 1201	Soil Science Basics	2/1
4	PNA 1220	Ecology Basics	2/1
5	MKS 1201	Organic Chemistry	2/0
6	MKS 1201P	Organic Chemistry Practicum	0/1
7	PNP 1201	Agricultural Sociology	2/0
8	PNB 1241	Statistic	2/0
9	PNB 1241P	Statistic Practicum	0/1
10	PNE 1221	Agricultural economy	2/0
		SUM	**21**

SEMESTER III			
No	**Kode**	**Course**	**SKS**
1	PNB 2111	The basics of Genetics	2/1
2	BDU 2106	English	2/0
3	PNT 2122	Basic climatology	2/1
4	PNH 2110	Basics of Plant Protection	2/0
5	PNU 2102	Biochemistry	2/0
6	PNU2102P	Biochemistry Practicum	0/1
7	PNP 2100	Dasar-Dasar Agricultural Counseling and	2/1
8	PNB 2141	Experimental Design	2/1
9	PNE 2153	Agricultural Business Management	2/0
		SUM	**21**

SEMESTER IV			
No	**Kode**	**Course**	**SKS**
1	PNB 2221	Basics of Plant Breeding	2/1
2	PNA 2200	Basics of Plant Physiology	2/1
3	PNU 2203	Introduction to Agricultural Biotechnology	2/0
4	PNH 2220	Basics of Plant Pests	2/1
5	PNH 2230	Basics of Plant Disease Science	2/1
6	PNE 2254	**Entrepreneurship**	2/0
7	PNE 2202	Mathematical Economics	3/0
8	PNE 2208	Microeconomics	3/0
		SUM	**22-24**

SEMESTER V			
No	**Kode**	**Course**	**SKS**
1	PNA 3144	Cultivation of Seasonal Crops	2/1
2	PNT 3115	Fertility, Fertilization and Soil Health	2/1
3	PNE 3107	Introduction to Marketing Science	2/0
4	PNE 3155	Agribusiness Management	2/0
5	PNE 3105	Introduction to Econometrics	2/1
6	PNE 3106	Socio-Economy Agriculture Assessment	0/2
7	PNU 3104	Research Method	2/0
8	PNE 3104	Macro economics	3/0
9		Elective course	
		SUM	**12-24**

SEMESTER VI			
No	**Kode**	**Course**	**SKS**
1	PNT 3225	Agricultural Water Management	2/1
2	PNU 3205	Regional Planning and Development	3/0
3	PNA 3248	Annual Crop Cultivation	2/1
4	PNE 3080	Field Work*)	0/2
5	PNE 3296	Application of Social Research Methods	0/1
6		Elective course	
	SUM		**20-24**

SEMESTER VII			
No	**Kode**	**Course**	**SKS**
1	UNU 310X	Pendidikan Agama	2/0
2	PNE 4085	Seminar *)	0/1
3	PNE 4090	Thesis *)	4-6
4	UNU 4050	Community Service Program*)	0/3
5		Elective course	
		SUM	**10-24**

SEMESTER VIII			
No	**Kode**	**Course**	**SKS**
1	PNE 4085	Seminar *)	0/1
2	PNE 4090	Thesis *)	4-6
3	UNU 4050	Community Service Program*)	0/3
4		Elective course	
	SUM		**8-24**

***) can be taken either in odd or even semester**

ELECTIVE COURSE			
Odd semester			
No	Kode	Course	SKS
1	PNE 3123	Agricultural Development	3/0
2	PNE 3127	Agricultural Politics	2/0
3	PNE 3157	Agricultural Marketing	2/1
4	PNE 2152	Accounting Basics	2/1
5	PNE 3156	Agriculture Project Analysis	2/1
6	PNE 3158	Basics of Operations Research	2/1
7	PNE 3159	Management Accounting	2/0
8	PNP 3110	Publishing Management	2/1
9	PNE3160	Cost accounting	2/0

ELECTIVE COURSE			
Even semester			
No	Kode	Course	SKS
1	PNE 3226	Economics of Agricultural Production	3/0
2	PNE 3261	Agricultural Cooperative	2/0
3	PNE 3214	Regional Economics	3/0
4	PNE 3215	International Economics	2/0
5	PNE 3216	Economics of Natural Resources and the	3/0
6	PNE 3210	Agro Industry Economics	3/0
7	PNE 3225	Human Resource Economics	2/0
8	PNE 3262	Human Resource Management	2/0
9	PNP 3221	Public Relation	2/1
10	PNP 3223	Advertising	2/1
11	PNE 3224	Managerial Economics	3/0
12	PNE 3263	Financial Management	2/0
13	PNP 3224	Pembangunan Masyarakat	2/0
14	PNE 3264	Agricultural Production Management	3/0

Curriculum

Agribusiness Study Concentration

SEMESTER I			
No	Kode	Course	SKS
1	UNU 1100	Pancasila	2/0
2	BDU 1105	Indonesian Language	2/0
3	MFS 1100	Basic Physics	2/0
4	MFS 1100P	Basic Physics Practicum	0/1
5	MKS 1100	Inorganic Chemistry	2/0
6	MKS 1100P	Inorganic Chemistry Practicum	0/1
7	BIO 1101	General Biology	2/1
8	MMS 1101	Mathematics	3/0
9	PNU 1101	Introduction to Agricultural Science	2/0
10	PNE 1151	Management Basics	2/0
		SUM	20

SEMESTER II			
No	**Kode**	**Course**	**SKS**
1	UNU 1200	Civic Education	2/0
2	PNA 1240	Agronomy Basics	2/1
3	PNT 1201	Soil Science Basics	2/1
4	PNA 1220	Ecology Basics	2/1
5	MKS 1201	Organic Chemistry	2/0
6	MKS 1201P	Organic Chemistry Practicum	0/1
7	PNP 1201	Agricultural Sociology	2/0
8	PNB 1241	Statistic	2/0
9	PNB 1241P	Statistic Practicum	0/1
10	PNE 1221	Agricultural economy	2/0
		SUM	**21**

SEMESTER III			
No	**Kode**	**Course**	**SKS**
1	PNB 2111	The basics of Genetics	2/1
2	BDU 2106	English	2/0
3	PNT 2122	Basic climatology	2/1
4	PNH 2110	Basics of Plant Protection	2/0
5	PNU 2102	Biochemistry	2/0
6	PNU2102P	Biochemistry Practicum	0/1
7	PNP 2100	Dasar-Dasar Agricultural Counseling and	2/1
8	PNB 2141	Experimental Design	2/1
9	PNE 2153	Agricultural Business Management	2/0
		SUM	**21**

SEMESTER IV			
No	**Kode**	**Course**	**SKS**
1	PNB 2221	Basics of Plant Breeding	2/1
2	PNA 2200	Basics of Plant Physiology	2/1
3	PNU 2203	Introduction to Agricultural Biotechnology	2/0
4	PNH 2220	Basics of Plant Pests	2/1
5	PNH 2230	Basics of Plant Disease Science	2/1
6	PNE 2254	**Entrepreneurship**	2/0
7	PNE 2202	Mathematical Economics	3/0
8	PNE 2203	Microeconomics	3/0
		SUM	**22-24**

SEMESTER V			
No	Kode	Course	SKS
1	PNA 3144	Cultivation of Seasonal Crops	2/1
2	PNT 3115	Fertility, Fertilization and Soil Health	2/1
3	PNE 3107	Introduction to Marketing Science	2/0
4	PNE 3155	Agribusiness Management	2/0
5	PNE 3105	Introduction to Econometrics	2/1
6	PNE 3106	Socio-Economy Agriculture Assessment	0/2
7	PNU 3104	Research Method	2/0
8	PNE 3104	Macro economics	3/0
		Elective course	
		SUM	22-24

SEMESTER VI		
No	Kode	Course
1	PNT 3225	Agricultural Water Managem
2	PNU 3205	Regional Planning and Develo
3	PNA 3248	Annual Crop Cultivation
4	PNE 3080	Field Work*)
5	PNE 3296	Application of Social Researcl
6		Elective course
		SUM

SEMESTER VII			
No	Kode	Course	SKS
1	UNU 310X	Pendidikan Agama	2/0
2	PNE 4085	Seminar *)	0/1
3	PNE 4090	Thesis *)	4-6
4	UNU 4050	Community Service Program*)	0/3
5		Elective course	
		SUM	10-24

SEMESTER VIII			
No	Kode	Course	SKS
1	PNE 4085	Seminar *)	0/1
2	PNE 4090	Thesis *)	4-6
3	UNU 4050	Community Service Program*)	0/3
4		Elective course	
		SUM	8-24

***) can be taken either in odd or even semester**

ELECTIVE COURSE			
Odd semester			
No	Kode	Course	SKS
1	PNE 2152	Accounting Basics	2/1
2	PNE 3156	Agriculture Project Analysis	2/1
3	PNE 3158	Basics of Operations Research	2/1
4	PNE 3159	Management Accounting	2/0
5	PNE 3157	Agricultural Marketing	2/1
6	PNE 3123	Agricultural Development	3/0
7	PNP 3110	Publishing Management	2/1
8	PNP 3224	Community Development	2/0
9	PNE 3127	Agricultural Politics	2/0
10	PNE 3160	Cost Accounting	2/0

ELECTIVE COURSE			
Even semester			
No	**Kode**	**Course**	**SKS**
1	PNE 3215	International Economics	2/0
2	PNE 3214	Regional Economics	3/0
3	PNE 3224	Managerial Economics	3/0
4	PNE 3263	Financial Management	2/0
5	PNE 3264	Agricultural production Management	3/0
6	PNE 3262	Human Resource Management	2/0
7	PNE 3261	Agricultural Cooperative	2/0
8	PNE 3216	Natural and Environmental Resource Economics	3/0
9	PNE 3210	Argo Industrial Economics	3/0
10	PNE 3225	Human Resource Economic	2/0
11	PNP 3221	Public Relation	2/1
12	PNP 3223	Advertising	2/1

Prerequisites
Agricultural economy & Agribusiness Study Program

NO.	KODE	MATAKULIAH	SCU	PRASYARAT
1	PNE 1201	Management Basics Agricultural Economics	2/0	-
2	PNE 2102	**Entrepreneurship**	2/0	-
3	PNE 2205	Management of Agricultural Business	2/0	Management Basics
4	PNE 2206	Mathematical Economics	2/0	Basics of Management,
5	PNE 2107	Microeconomics Macroeconomic	3/0	Agricultural economy Mathematics, Agricultural
6	PNE 3108	Introduction to Econometrics Agribusiness	3/0	economics
7	PNE 3109	Agricultural Development Management	3/0	Agricultural economics
8	PNE 3110	Introduction to Marketing Science	2/1	Agricultural economics
9	PNE 3111	Socio-Economy Agriculture Assessment	2/0	Statistic,
10	PNE 3117	Economics of Agricultural Production	3/0	Mathematical Economics
11	PNE 3213	Regional Economics International Economics	2/0	Basics of Management,
12	PNE 3032	natural & environmental resources Economics	0/2	Agricultural economy Agricultural
13	PNE 3115	Social Economic Research Application	3/0	economics
14	PNE 3124	Accounting Basics Agriculture Production	3/0	Basics of Management
15	PNE 3126	Management	2/0	Agricultural economy
16	PNE 3122	Cost accounting	3/0	Agricultural Business
17	PNE 3004	Agricultural Project Analysis	0/1	Management
18	PNE 3212	Agricultural Marketing	2/1	Agricultural economics
19	PNE 3219	Basics of Operation Research	3/0	Agricultural economics
20	PNE 4128	Management Accounting	2/0	Microeconomics,
21	PNE 4130	Agricultural Politics	2/1	Macroeconomics
22	PNE 4214	Agro-industrial Economics	2/1	Microeconomics
23	PNE 4227	Managerial Economics	2/1	Research Method
24	PNE 4229	Agricultural Cooperation	2/0	-
25	PNE 4131	Human Resource Management	2/0	Management Basics
26	PNE 4125	Human Resource Economics	3/0	Accounting Basics
27	PNE 3118	Field Work	3/0	Agricultural Economics
28	PNE 4016	Seminar	2/1	Introduction to Marketing Science, Microeconomics
29	PNE 4221	Thesis	2/0	Mathematics, Mathematical Economics
30	PNE 3220		2/0	Accounting Basics
31	PNE 4123		2/0	Microeconomics, Economics
32	PNE 4060		0/2	Macro- Microeconomics
33	PNE 4080		0/1	Microeconomics
34	PNE 4090		4-6	Agricultural economics Management Basics Management Basics Microeconomics Have taken 100 CSU have taken 100 CSU have taken 120 SCU

4.2. Agricultural Counseling and Communication Study Program

Vision

To become a superior study program in producing quality human resources who have competence in the development of science and technology in the field of Agricultural Counseling and Communication, for efforts to empower people to improve welfare.

Mission

To provide appropriate education for the development of science and technology in the field of Agricultural Counseling and Communication through the process of education, researchers and quality and professional community service by developing and utilizing relevant cooperation networks.

Goal

To improve the quality of graduates of Agricultural Counseling and Communication Study Programs that are appropriate to meet the demands of the development of community life.

Objective

To provide the graduates of the Agricultural Counseling and Communication Study Program, so that they are able to:

a. Master the social engineering techniques so that they can put themselves as part of the community empowerment mechanism;

b. Be responsive and see the opportunities for advantage of developments in science and technology to improve farming activities and solve problems faced by the community;

c. Have additional abilities in the field of Agricultural Counseling and Communication for work careers and further education.

Graduate Profile

1. Extension Workers / Community Developers
2. Consultant / reviewer for community development
3. Event organizer
4. Educators
5. Researchers
6. Media Manager
3. Extension Workers / Community Developers
4. Consultant / reviewer of community development
3. Event organizer
7. Educators
8. Researcher
9. Media Manager

Graduates Competency

1. Extension Workers / Community Developers

a. Having sensitivity to community socio-cultural issues / problems related to agricultural development.

b. having the ability to formulate and implement strategies and use methods and resources to increase community capacity to face the challenges of future community development.

c. having the ability to facilitate, motivate, organize, and initiate collaborative agribusiness stakeholder groups to support the formulation and sustainability of development processes that involve the participation of the community.

2. Consultants/Reviewers of Community Development

a. having the ability make analytical and synthetical thinking

b. having the ability provide community development solutions

c. having the ability to negotiate and communicate effectively with stakeholders in community development by utilizing information technology.

3. Event Organizer

a. having the ability to manage all components in the implementation of an event.

b. having the ability to administer market events.

4. Educator

a. having the ability to master and apply learning methods.

b. having the ability to provide motivation for the students.

5. Research

a. having the ability to precisely identify, analyze and formulate problems in the field of Agricultural Counseling and Communication.

b. having the ability to design and carry out research.

c. having the ability to recommend correct solving problems in the field of Agricultural Counseling and Communication.

Media Manager

a. Having the ability to collect, process, present and disseminate agricultural information.

b. Having the ability to manage media organizations.

Special Competencies (University Identifiers: Popular and Scientific)

1. Having the ability to actualize local wisdom in agricultural development.

2. Having the ability to organize society in response to global warming and climate change.

Curriculum

SEMESTER I			
No	**Kode**	**Course**	**SKS**
1	UNU 1100	Pancasila	2/0
2	BDU 1105	Indonesian Language	2/0
3	MFS 1100	Basic Physics	2/0
4	MFS 1100P	Basic Physics Practicum	0/1
5	MKS 1100	Inorganic Chemistry	2/0
6	MKS 1100P	Inorganic Chemistry Practicum	0/1
7	BIO 1101	General Biology	2/1
8	MMS 1101	Mathematics	3/0
9	PNU 1101	Introduction to Agricultural Science	2/0
10	PNE 1151	Management Basics	2/0
		SUM	20

SEMESTER II			
No	**Kode**	**Course**	**SKS**
1	UNU 1200	Civic Education	2/0
2	PNA 1240	Agronomy Basics	2/1
3	PNT 1201	Soil Science Basics	2/1
4	PNA 1220	Ecology Basics	2/1
5	MKS 1201	Organic Chemistry	2/0
6	MKS 1201P	Organic Chemistry Practicum	0/1
7	PNP 1201	Agricultural Sociology	2/0
8	PNB 1241	Statistic	2/0
9	PNB 1241P	Statistic Practicum	0/1
10	PNE 1221	Agricultural economy	2/0
		SUM	21

SEMESTER III			
No	**Kode**	**Course**	**SKS**
1	PNB 2111	The basics of Genetics	2/1
2	BDU 2106	English	2/0
3	PNT 2122	Basic climatology	2/1
4	PNH 2110	Basics of Plant Protection	2/0
5	PNU 2102	Biochemistry	2/0
6	PNU 2102P	Biochemistry Practicum	0/1
7	PNP 2100	Dasar-Dasar Agricultural Counseling and	2/1
8	PNB 2141	Experimental Design	2/1
9	PNE 2153	Agricultural Business Management	2/0
		SUM	**21**

SEMESTER IV			
No	**Kode**	**Course**	**SKS**
1	PNB 2221	Basics of Plant Breeding	2/1
2	PNA 2200	Basics of Plant Physiology	2/1
3	PNP 2203	Mass communication	2/0
4	PNH 2220	Basics of Plant Pest Science	2/1
5	PNH 2230	Basics of Plant Disease Science	2/1
6	PNU 2203	Introduction to Agricultural Biotechnology	2/0
7	PNP 2204	Social Psychology	2/0
8	PNE 2254	**Entrepreneurship**	2/0
9		Elective course	
		SUM	**18-24**

SEMESTER V

No	Kode	Course	SKS
1	UNU 310X	Pendidikan Agama	

SEMESTER VIII

No	Kode	Course
1	PNP 4085	Seminar *)
2	PNP 4090	Thesis *)
3	UNU 4050	Community Service Program*)
4		Elective course
		SUM
8	PNE 3106	Socio-Economy Agriculture Assessment
9		Elective course
		SUM

***) can be taken either in odd or even semester**

SEMESTER VI

No	Kode	Course	S
1	PNT 3225	Agricultural Water Management	2
2	PNU 3205	Regional Planning and Development	3
3	PNA 3248	Annual Crop Cultivation	2
4	PNP 3080	Field Work*)	0
5	PNP 3212	Agricultural Counseling and Communication Program	2
6	PNP 3213	Social communication	2
7	PNP 3214	Application of Social Research Methods	0
8	PNP 3224	Pembangunan Masyarakat	2
9		Elective course	
		SUM	**19**

SEMESTER VII

No	Kode	Course	SKS
1	PNP 4085	Seminar *)	0/1
2	PNP 4090	Thesis *)	4-6
3	UNU 4050	Community Service Program*)	0/3
4		Elective course	
		SUM	**8-24**

ELECTIVE COURSE

Odd semester

No	Kode	Course	SKS
1	PNP 3108	Social organization	2/0
2	PNP 3109	Photography in Agriculture	0/2
3	PNP 4125	Agricultural Extension and Communication Administration	2/1
4	PNP 4126	Evaluation of the Agricultural Extension and Communication Program	2/1
5	PNP 3110	Publishing Management	2/1
6	PNP 3111	Verbal communication	2/0
7	PNE 3123	Agricultural Development	3/0
8	PNE 3157	Agricultural Marketing	2/1
9	PNE 3155	Agribusiness Management	3/0
10	PNE 3127	Agricultural Politics	2/0
11	PNE 3156	Agriculture Project Analysis	2/1
12		Courses in other Study Program within UGM	

ELECTIVE COURSE			
Even semester			
No	**Kode**	**Course**	**SKS**
1	PNP 3215	Agricultural Audio-Video	0/2
2	PNP 3216	Family Sociology	2/0
3	PNP 3217	Group dynamics	2/0
4	PNP 3218	Human Ecology	2/0
5	PNP 3219	Social transformation	2/0
6	PNP 3220	Broadcast Management	2/0
7	PNP 3221	Public relations	2/1
8	PNP 3222	Agricultural Journalism	2/1
9	PNP 3223	Advertising	2/1
10	PNP 4227	Special Issues	0/1
11	PNE 3261	Agricultural Cooperative	2/0
12	PNE 3216	Natural Resource Economics and the Environment	3/0
13		Courses in other Study Program within UGM	

5. DEPARTEMENT OF SOIL

Vision

The Vision of Soil Science Study Program is to become a superior study program that is able to produce quality human resources as well as to solve the problem of environmental management of land in preserving natural resources, by mastering science and technology. The soil study program is endeavored to become a research-based, higher education institution oriented as the interests of the nation and the welfare of the people based on Pancasila.

Mission

1. To administer undergraduate education (S1, S2, and S3) in the field of Soil Science based research that is able to identify problems and be able to find ways to solve them based on the principles of sustainable land and land management.
2. to conduct sustainable strategic research based on regional potential to solve the problems of the agricultural sector by developing science and technology.
3. To provide services and community service with a structured and integrated program for community empowerment.
4. To develop institutions that are responsive to the development of science and technology, government policies and community needs.

Graduates Profile

1. Actors in the field of land and water management; as a bureaucrat, soil and fertilizer counselor, and soil and fertilizer consultant, educator, and researcher in the fields of soil, water and fertilizer.
2. Managers who master land optimization, land planning and mapping, and fertilizing in private and state-owned companies as well as in the fertilizer industry.
3. Entrepreneurs who master land use, land planning and mapping and fertilizer technology in private companies; BUMN; fertilizer industry as well as in non-agricultural fields.
4. Actors in agriculture in general

GRADUATES COMPETENCE

Main Competence

The main competency of graduates of the soil science study program is to have broad, capable and skilled insight in identifying and seeking solutions to land and land management problems based on environmentally sound land management principles in conserving natural resources. In detail the main competencies are formulated as follows:

1. Able to develop science and technology related to land management to solve land and agriculture science problems for community interests.
2. Being able to analyze the physical properties of the soil, design land use and apply the rules of soil and water conservation and carry out land reclamation to suit its ability for certain uses in a sustainable manner.
3. Able to identify, classify, and map land and evaluate land for various purposes.
4. Able to analyze the chemical properties of soil, fertilizer, plants, water and be able to make fertilizer and remediation recommendations for preserving soil fertility.
5. Able to do climate analysis for the benefit of agriculture and mitigate global warming

and climate change
6. Be able to consistently learn and improve for
proceed to a higher level of science both S2 and S3.

Supporting Competency

1. Having a good personality.
2. Upholding the value of the Pancasila and the Unitary Republic of the Republic Indonesia
3. having the ability to communicate with Indonesian properly and correctly
4. having the ability to communicate in English
5. having the ability in information technology skills
6. having the ability to work take cooperative works with other fields to solve agricultural and environmental problems

Other Competencies:

1. having the ability to innovate in the field of soil science in particular and agriculture in general
2. having the ability to live independently and develop the community through entrepreneurship in agriculture
3. having the ability to actualize local wisdom in agricultural development

Note: Understanding of core competencies, supporters, and others can be seen in *Kepmendiknas* No. 045/2002.

Curriculum

SEMESTER I			
No	**Kode**	**Course**	**SKS**
1	UNU 1100	Pancasila	2/0
2	BDU 1105	Indonesian Language	2/0
3	MFS 1100	Basic Physics	2/0
4	MFS 1100P	Basic Physics Practicum	0/1
5	MKS 1100	Inorganic Chemistry	2/0
6	MKS 1100P	Inorganic Chemistry Practicum	0/1
7	BIO 1101	General Biology	2/1
8	MMS 1101	Mathematics	3/0
9	PNU 1101	Introduction to Agricultural Science	2/0
10	PNE 1151	Management Basics	2/0
		SUM	**20**

SEMESTER II			
No	**Kode**	**Course**	**SKS**
1	UNU 1200	Civic Education	2/0
2	PNA 1240	Agronomy Basics	2/1
3	PNT 1201	Soil Science Basics	2/1
4	PNA 1220	Ecology Basics	2/1
5	MKS 1201	Organic Chemistry	2/0
6	MKS 1201P	Organic Chemistry Practicum	0/1
7	PNP 1201	Agricultural Sociology	2/0
8	PNB 1241	Statistic	2/0
9	PNB 1241P	Statistic Practicum	0/1
10	PNE 1221	Agricultural economy	2/0
		SUM	**21**

SEMESTER III			
No	**Kode**	**Course**	**SKS**
1	PNB 2111	The basics of	2/1
2	BDU 2106	Genetics English	2/0
3	PNT 2122	Basic climatology	2/1
4	PNH 2110	Basics of Plant Protection	2/0
5	PNU 2102	Biochemistry	2/0
6	PNU 2102P	Biochemistry Practicum	0/1
7	PNP 2100	Dasar-Dasar Agricultural Counseling and Communication	2/1
8	PNB 2141	Experimental Design	2/1
9	PNE 2153	Agricultural Business	2/0
		Management **SUM**	**21**

SEMESTER IV			
No	**Kode**	**Course**	**SKS**
1	PNB 2221	Basics of Plant Breeding	2/1
2	PNA 2200	Basics of Plant Physiology	2/1
3	PNH 2220	Basics of Plant Pest Science	2/1
4	PNH 2230	Basics of Plant Disease Science	2/1
5	PNU 2203	Introduction to Agricultural Biotechnology	2/0
6	PNE 2254	**Entrepreneurship**	2/0
7	PNT 2213	Soil Chemistry Science	2/1
8	PNT 2204	Geology and Soil Mineralogy	2/1
		Elective course	
		SUM	**22-24**

No	**Kode**	**Course**	**SKS**
1	UNU 310X	Pendidikan Agama	2/0
2	PNA 3144	Cultivation of Seasonal Crops	2/1
3	PNT 3115	Fertility, Fertilization and Soil Health	2/1
4	PNU 3104	Research Method	2/0
5	PNT 3119	Soil Biology	2/1
6	PNT 3107	Genesis dan Soil Class	2/1
7	PNT 3112	Land Conservation and Reclamation	2/1
8	PNT 3110	Soil Physics	2/1
9		Elective course	
		SUM	**22-24**

SEMESTER VI			
No	**Kode**	**Course**	**SKS**
1	PNT 3225	Agricultural Water Management	2/1
2	PNU 3205	Regional Planning and Development	3/0
3	PNA 3248	Annual Crop Cultivation	2/1
4	PNT 3080	Field Work*)	0/2
5	PNT 3216	Plant Nutrition	2/1
6	PNT 3203	Research Method Tanah	2/0
7	PNT 3211	Relationship of Land, Water, Plants & Atmosphere	2/1
8		Elective course	
		SUM	**19-24**

SEMESTER VII			
No	**Kode**	**Course**	**SKS**
1	UNU 4050	Community Service Program*)	0/3
2	PNT 4085	Seminar*)	0/1
3	PNT 4090	Thesis*)	4-6
4	PNT 4118	Land Pollution	2/0
5	PNT 3208	Survey, Evaluation, Land Use	2/1
6		Elective course	
		SUM	**13-24**

***) can be taken either in odd or even semester**

SEMESTER VIII		
No	**Kode**	**Course**
1	UNU 4050	Community Service Program*)
2	PNT 4085	Seminar*)
3	PNT 4090	Thesis*)
4		Elective course
		SUM

ELECTIVE COURSE
Odd semester

No	Kode	Course	SKS
1	PNT 4117	Fertilization and Fertilizer Technology	2/0
2	PNT 4123	Agricultural Climatology	2/1
3	PNT 4120	Land Management	2/1
4	PNT 4109	Digitization and Information Systems	2/1
5		Courses in other Study Program within UGM	

ELECTIVE COURSE		
Even semester		
No	**Kode**	**Course**
1	PNT 3214	Colloidal Chemical Physics
2	PNT 3202	Analysis of Soil, Water, Fertilizers and Plants
3	PNT 3205	Geomorphs and Landscape Analysis
4	PNT 3206	Handasah and Cartography
5		Courses in other Study Program within UGM

6. DEPARTMENT OF AGRICULTURAL MICROBIOLOGY

6.1. Agricultural Microbiology Study Program

Vision

To become the Pioneer of Education and Research in the Field of Agricultural Microbiology in Indonesia, which has an International Level and Upholds the Nation Based on Pancasila.

Missions

In realizing the vision of the Agricultural Microbiology Study Program, the missions are formulated as follows:

1. to administer a first-rate education in the field of Agricultural Microbiology at an international level that encourages the success of graduate careers to improve the quality of life of the nation.
2. to support the progress of Agricultural Microbiology researchers who underpin education and advancement of science, technology, and enrichment of the nation's culture.
3. to align the educational and research programs with community service activities.
4. to operate and pioneering cooperation programs both nationally and internationally with educational institutions, government researchers, the business world, and the community.

Objective

The objectives of the Agricultural Microbiology Study Program:

1. to produce graduates at the undergraduate level in the field of Agricultural Microbiology who are devoted to God Almighty, nationalist, egalitarian, firm in holding the mandate, and disciplined.
2. to produce graduates who master knowledge about biology and plant production technology and microorganisms, master the engineering and propagation of microorganisms, and are able to carry out agricultural businesses based on the use of environmentally friendly and sustainable microorganisms.
3. to produce graduates who are capable of acting and behaving scientifically, independently, and competitively so as to be able to continue to higher level of home or abroad education.
4. to produce scientific works to be published in national and international journals and developing it into technology in the field of Agricultural Microbiology to be beneficial for the community, farmers, government, and industry.
5. to generate cooperation in the fields of education, researchers and community service with institutions at home and abroad.

Graduates Profile

Graduates of the Microbiology Study Program have the competence to work in the following five fields:

1. Microbiology Specialist Lab
2. Microbiology Research Assistant
3. Prospective Microbiology Scientists
4. Garden Assistant with microbiology expertise
5. Entrepreneurs in the field of microbiology

Graduates competence

Graduates competence of Agricultural Microbiology Study Program include:

1. **Microbiology Lab Specialist**

a. having the ability to test microbiological products
b. having the ability to design experiments, protocols for implementation, using techniques and equipment used in research
c. having the ability to work in a team
d. having the ability to direct and control subordinates
e. having the ability to comprehend and understand the latest developments in the field of microbiology
f. having the ability to prepare report presentations

2. **Assistant to Microbiological Researcher**

a. having the ability to design experiments, use protocols and techniques and operate tools for conducting research
b. having the ability to work in a team
c. having the ability to direct and control technicians
d. having the ability the comprehend and understand the latest developments in the field of microbiology
e. having the ability to prepare scientific reports and articles, and to make scientific presentations

3. **Future Scientist of Microbiology**

a. having the ability to meet the qualifications to continue to higher level of study
b. having the ability to design experiments, use protocols and techniques and operate tools for conducting research
c. having the ability to work in a team
d. having the ability to comprehend and understand the latest developments in the field of microbiology
e. having the ability to prepare scientific reports and articles, and make scientific presentations

4. **Farm Assistant with Microbiology Competence**

a. having the ability to design experiments, use protocols and techniques and operate tools for carrying out technology testing
b. having the ability to search and analyze data for the purpose of helping with garden management

c. having the ability to perform group and individual works
d. having the ability to direct and control subordinates
e. having the ability to comprehend and understand the latest technological developments in the field of microbiology
f. having the ability to make prepare and make report presentations
g. having the ability to work well under pressure

5. Entrepreneurs in Microbiology

a. having the ability to identify and analyze business opportunities in the Field of Agricultural Microbiology
b. having the courage to start a business in the field of Agricultural Microbiology
c. having the ability to implement techniques in making microbiology-based products
d. having the ability to search and analyze data for business management purposes
e. having the ability to perform group and individual works
f. having the ability to direct and control subordinates
g. having the ability to comprehend and understand the latest technological developments in the field of microbiology
h. having the ability to work well under pressure

Curriculum

SEMESTER I			
No	**Kode**	**Course**	**SKS**
1	UNU 1100	Pancasila	2/0
2	BDU 1105	Indonesian Language	2/0
3	MFS 1100	Basic Physics	2/0
4	MFS 1100P	Basic Physics Practicum	0/1
5	MKS 1100	Inorganic Chemistry	2/0
6	MKS 1100P	Inorganic Chemistry Practicum	0/1
7	BIO 1101	General Biology	2/1
8	MMS 1101	Mathematics	3/0
9	PNU 1101	Introduction to Agricultural Science	2/0
10	PNE 1151	Management Basics	2/0
		SUM	**20**

SEMESTER II			
No	**Kode**	**Course**	**SKS**
1	UNU 1200	Civic Education	2/0
2	PNA 1240	Agronomy Basics	2/1
3	PNT 1201	Soil Science Basics	2/1
4	PNA 1220	Ecology Basics	2/1
5	MKS 1201	Organic Chemistry	2/0
6	MKS 1201P	Organic Chemistry Practicum	0/1
7	PNP 1201	Agricultural Sociology	2/0
8	PNB 1241	Statistic	2/0
9	PNB 1241P	Statistic Practicum	0/1
10	PNE 1221	Agricultural economy	2/0
		SUM	**21**

SEMESTER III			
No	**Kode**	**Course**	**SKS**
1	PNB 2111	The basics of Genetics	2/1
2	BDU 2106	English	2/0
3	PNT 2122	Basic climatology	2/1
4	PNH 2110	Basics of Plant Protection	2/0
5	PNU 2102	Biochemistry	2/0
6	PNU 2102P	Biochemistry Practicum	0/1
7	PNP 2100	Basics of Agricultural Counseling and Communication	2/1
8	PNB 2141	Experiment Design	2/1
9	PNE 2153	Agricultural Business Management	2/0
		SUM	**21**

SEMESTER IV			
No	**Kode**	**Course**	**SKS**
1	PNB 2221	Basics of Plant Breeding	2/1
2	PNA 2200	Basics of Plant Physiology	2/1
3	PNH 2220	Basics of Plant Pest Science	2/1
4	PNH 2230	Basics of Plant Disease Science	2/1
5	PNU 2203	Introduction to Agricultural Biotechnology	2/0
6	PNM 2231	Introduction to Enzymology	2/0
7	PNM 2211	Dasar-Dasar Microbiology	2/1
8	PNE 2254	**Entrepreneurship**	2/0
9		Elective course	
		SUM	**21-24**

SEMESTER V			
No	**Kode**	**Course**	**SKS**
1	UNU 310X	Pendidikan Agama	2/0
2	PNA 3144	Cultivation of Seasonal Crops	2/1
3	PNT 3115	Fertilization and Soil Fertility Tanah	2/1
4	PNM 3112	Introduction to Microbial Taxonomy	2/1
5	PNM 3132	Microbial Physiology	2/1
6	PNM 3121	Microbial Genetics	2/1
7	PNM 3141	Microbial Ecology	2/1
8	PNU 3104	Research Method	2/0
9		Elective course	
		SUM	**21-24**

SEMESTER VI			
No	**Kode**	**Course**	**SKS**
1	PNT 3225	Agricultural Water Management	2/1
2	PNU 3205	Regional Planning and Development	3/0
3	PNA 3248	Annual Crop Cultivation	2/1
4	PNM 3261	Soil Microbiology	2/1
5	PNM 3262	Microbiology Air	2/1
6	PNM 3251	Microbiology Agroindustri	2/1
7	PNM 3080	Field Work*)	0/2
8		Elective course	
		SUM	**22-24**

SEMESTER VII			
No	Kode	Course	SKS
1	UNU 4050	Community Service Program*)	0/3
2	PNM 4085	Seminar*)	0/1
3	PNM 4090	Thesis*)	4-6
4		Elective course	
		SUM	8-24

SEMESTER VIII			
No	Kode	Course	SKS
1	UNU 4050	Community Service Program*)	0/3
2	PNM 4085	Seminar*)	0/1
3	PNM 4090	Thesis*)	4-6
4		Elective course	
		SUM	8-24

***) can be taken either in odd or even semester**

ELECTIVE COURSE			
Odd semester			
No	Kode	Course	SKS
1	PNM 4142	Microbial Biodiversity	2/0
2	PNM 4151	Post-Harvest Microbiology	2/1
3	PNM 4164	Introduction to Biodegradation and bioremediation	2/0
4	PNM 4163	Soil and Environmental Biotechnology	2/0
5	PNB 3112	Molecular Genetics	2/0
6	PNH 3161	Plant Protection Biotechnology	2/0
7	PIT 3124	Microbiology of Fishery Products	2/1
8		Courses in other Study Program within UGM	

ELECTIVE COURSE		
Even semester		
No	Kode	Course
1	PNM 3233	Introduction to Enzyme Technology
2	PNM 3234	Biomass Production Technology
3	PNM 3252	Biological safety
4	PNM 3253	Thermal microbiology
5	PNH 3271	Basics of Insect Pathology
6	PIT 4227	Toxicology and Hygiene
7	PNH 3284	Introduction to Plant Virology
8		Courses in other Study Program

UNDERGRADUATE COURSE SYLLABUS
UNDERGRADUATE PROGRAM
FACULTY OF AGRICULTURE UGM

1. BASIC COURSES

Basic Physic (MFS 1100; 2/0)

Basic units and vectors, equations of straight and curvilinear motion, Newton's Laws I, II, III, work, conservative forces, power, momentum, and central force. Zarah system, kinemati a and dynamics of rigid bodies, and torque. Vibration, waves, sound, and elasticity. Mechanical mechanics and dynamics. Calorimetry, expansion, latent heat, heat transfer, and the laws of thermodynamics. Electrostatic: Field strength and electric potential, capacitors. Electrodynamics: Resistivity, ohm law, DC electric strands, magnetism, alternating current, and RMS prices. Optics: Electromagnetic waves, light, interference, and diffraction. Photon theory, de Broglie waves, simple atoms, complex atoms, solids, and elementary particles.

Inorganic Chemistry (MKS 1100; 2/0)

Elemental symbols, atomic numbers and masses, compound formulas. Reactions and coefficients, reaction types, solution concentrations, conversions in reactions, chemical solvents. Electrostatic, synthesis, specific gravity, specific heat, freezing point, boiling point, melting point, sublimation, acid, hydroxide, water potable (drinking water). Reduction, acids, bases, electron transfer, cathode and anode oxidation reactions. Radioactivity and radioactive elements, α, β rays, γ succession of radioactive disintegration. Alkaline, alkaline earth, carbon, nitrogen, sulfur, and metal elements.

Mathematics (MMS 1101; 3/0)

Number and set systems. Functions, series, and limits.
Derivate I: differential understanding, geometric meaning, tangent, derivative as rate. Derivatives II: high order derivatives, up and down functions, function graphs, Taylor series. Matrices: algebra, inverses, elementary operations, Gauss order, determinants, linear equation arrangement.

Organic Chemistry (MKS 1201; 2/0)

Atoms and molecules. Orbital in covalent bonding. Isometric structure, and nomenclature. Spectroscopy and IR. Stereochemistry. Hydrocarbon compounds, alcohols, ethers, and amines. Resonance and aromaticity. Alkyl halides and carbonyl compounds. Carbobrates, fats and proteins.

Statistic (PNB 1241; 2/0)

The scope and usefulness of statistics. Presentation of data, list of frequencies, histograms and branches, box diagrams, lines and beam points. Rule of opportunity. Discussion of population and examples.

General Biology (BIO 1101; 2/1)

Biology as a science. Organization of life: chemicals, molecules and organisms. The division of organisms in relation to agriculture. Plant world especially spermatophyte: cytology, histology, and organology of plants. Identification, classification of plants and their role in agriculture. Zoology: introduction. identification, classification (invertebrates, vertebrates), the role and significance of animals in plant-based agriculture.

Body Organization, physiology.

Biochemical (PNU 2102; 2/1)

introducing the characteristics of living materials, the role of biochemistry in understanding life processes and the over-view of biomolecular constituents and the properties of biomolecules, enzymes, DNA and RNA, metabolism and biological functions of carbohydrates, lipids, amino acids and peptides (proteins), and genetic information flow.

English (BDU 2106; 2/0)

Review of English grammar (compared to Indonesian grammar), reading skills (understanding grammar and contents of reading material: journals, technical information, books, or other forms of publication in agriculture), writing skills (able to write and apply correct grammar both in format business letter, application letter, or scientific report in the form of abstract, summary, and poster).

Introduction to Agricultural Science (PNU 1101; 2/0)

Discussion of the meaning and history of agricultural development, agricultural systems, agricultural institutions, the role of agricultural education and the application of science and technology in national development, the role of the agricultural sector in national development, food, population welfare, human rights and the environment, future agriculture and national policies, and global agreements in agriculture.

Research Methodology (PNU 3104; 2/1)

Definition of research and experiments and planning, methods of data collection (questionnaires, interviews, observations), procedures and preparation, field trial techniques, design and analysis of data and drawing conclusions.

Regional Planning and Development (PNU 3205; 3/0)

Assessing the definition and scope of regional development. Basic principles of spatial planning (development at the national, regional, urban, rural level, aspects of natural resources and human resources). At the national and regional level, it is necessary to zoning interactions between land and climate, the availability of human resources, aspects of physical infrastructure and facilities in the region. At the urban and rural level, it is necessary to know the basic material needs, regional potential, natural resource potential, urban/rural facilities. Potential and management of environmental factors (landscape planning, management and cultivation, land and water conservation, basics of calculating value added economically).

2. AGRONOMIC STUDY PROGRAM (Interest in Agronomy Studies for class of 2015 and after)

Agronomy Basics (PNA 1240; 2/1)

Definition of agriculture and agronomy along with their scope and role in agricultural development, the origin of the spread and classification of agricultural crops, types of agricultural systems, factors affecting plant growth, land clearing and conservation, plant propagation, crop cultivation techniques, use of advanced technology in agriculture, harvest and post-harvest preparations, cases of agricultural development in Indonesia.

Plant Management (PNA 3252; 2/1)

Discussion of basic processes and determinants of crop production, interaction of plants and growing environment, concepts, and management of healthy plants. Identification, characterization, and evaluation of cropping systems. Various cultivation efforts towards quality, sustainable and profitable planting systems.

Seasonal Crop Cultivation (PNA 3144; 2/1)

Definition of grouping, special characteristics of annual plant groups. The influence of genetic, edaphic, climatic and fertility factors on plant growth and yield. The genetic factor discusses the characteristics and ways of obtaining superior varieties. The factors include fertility, climate factors include rainfall, temperature, and light. The factor discusses the influence of topography and the location of latitude in relation to crop yields. Ways and systems of crop cultivation include seeding, planting, planting patterns and systems as well as, maintenance. How to cultivate sugar cane, tobacco, cereal crops, legumes, fiber plants and tuber crops.

Annual Crop Cultivation (PNA 3248; 2/1)

Definition, grouping, special characteristics and conditions of growth for each group of annual plants. Ways and systems of crop cultivation include land clearing, seeding, planting, maintenance, pruning, cover trees, cover crops, crop diversification and crop protection and yield collection. Land clearing and conservation methods, making planting holes, planting spacing patterns, and planting seeds. Plant maintenance includes thinning, fertilizing and weeding. Pruning includes the form, method and purpose of pruning. Kinds and weaknesses of tree cover and ground cover.

Weed Science (PNA 3256; 2/1)

Understanding the role of classification, biological characteristics and weed distribution, classification of weeds based on life cycle, habitat, morphological and growth characteristics. Weed competition with plants, the factors that influence the strategy and how to control weeds include determining the threshold of weed control, prevention of technical, mechanical, biological and chemical culture. The manner and time of application, effectiveness and toxicity of herbicides.

Introduction to Planting Systems (PNA 3150; 2/0)

The rules and concepts of systems and cropping systems. Plant system components and analysis. Kind and understanding of various planting systems. The basis, development and management of profitable and sustainable crop systems. Planting systems in the tropics and wet tropics.

Special Topic of Agronomy (PNA 4186; 1/0)

Discussion on the specific topic of developing agronomy.

Agronomy Field Study (PNA 4182; 0/2)

Examine agronomic aspects in practice and link them to what is learned.

Ecology Basics (PNA 1220; 2/1)

Definition of ecology, the history of its development, links to other sciences, material cycles and energy flows, biochemical cycles, ecosystems, factors affecting changes in environmental conditions and their impacts, succession, and understanding of the importance of ecology and the environment and their application.

Agroecology (PNA 4128; 2/0)

Definition of agroecosystems; structure and function; interaction within the agroecosystem; agroecosystem analysis; zoning / agroecological zones and their development.

Basics of Plant Physiology (PNA 2200; 2/1)

Definition and scope of plant physiology, cell and cell organelle, party movements in the form of diffusion, osmosis and imbibition. The role of water for plants, absorption and transportation of water

and transpiration. In metabolism discussed enzymes, photosynthesis and respiration. Photosynthesis: includes light reactions, dark reactions and influential factors. Respiration: includes glycolysis, the Kreb cycle, influencing factors and light respiration. Transport of photosynthesis, pathways and transport theory.

Plant Physiology (PNA 3108; 2/1)

Growth analysis: includes observation, calculation. The relationship between observational variables is related to results. Plant factors that influence the process of plant growth and yield include canopy architecture, source relationships and plant roots. Environmental factors that influence the process of fi, growth and yield of plants in the form of water, light, and temperature.

Vegetable and Hydroponic Plant Cultivation (PNA 3160; 2/1)

Boundaries of Vegetable, origin of tissues and organs eaten, vegetable use, classification of vegetable plants, environmental factors for growing and cultivating various types of vegetable plants, special treatment in the cultivation of vegetable plants (vegetables forcing).

Types of vegetable plants that are cultivated hydroponically, a variety of growing media, hydroponic equipment and green houses, hydroponic nutrition, harvest and post-harvest handling of vegetables, vegetable plant breeding and vegetable seed production.

Landscape and Ornamental Plant Cultivation (PNA 3164; 2/1)

Discussion of the understanding of horticultural landscapes, the flow of developing landscapes, and the design of landscapes and parks, as well as the importance of ornamental plants, classification and cultivation of ornamental plants with examples of economic value of ornamental plant cultivation.

Home yard and Fruit Cultivation (PNA 3270; 2/1)

Understanding yard and yard function, environmental conditions in the yard and cultivation of plants in homeyard. Understanding of fruit, its benefits and significance as food and trade commodities, fruit, classification of fruit plants, cultivation techniques and examples of economic fruit cultivation.

Horticulture Post-Harvest (PNA 3272; 2/1)

Understanding of the meaning of post-harvest handling of horticulture products, changes in the structure and chemical composition of horticultural products, harvesting, fruit ripening, climacteric respiration, factors that affect the shelf life of horticultural produce, handling and irregularities.

Medicinal Plant Cultivation (PNA 3166; 2/0)

Definition of medicinal plants, classification of plants, benefits, ways of cultivating medicinal plants and handling the results.

Orchid Cultivation (PNA 3268; 1/1)

Orchid cultivation: the uses and prospects of orchids, the introduction of species based on the morphology of plants and orchids, the classification of orchid plants, growing requirements, ways of propagation, cultivation, plant breeding and evaluation of orchids.

Plant Network Cultivation (PNA 3262; 2/1)

History, benefits and types of tissue culture, organization and laboratory facilities, planting media, implementation techniques and the factors that influence it.

Plant Ecology (PNA 3262; 2/1)

Preliminary study of the interrelationships between plants and the environment, the reaction of plants to environmental conditions (weather, temperature, sunlight with plants as plant communities, competition) (including allelopathy and relationships between plants, by introducing agroecosystems.

2. PLANT BREEDING STUDY PROGRAM (in Plant Breeding Interest Studies (for class of 2015 and after)

The basics of Genetics (PNB 2111; 2/1)

Definition and history of genetic development, life cycle and plant development, cell division. Mendelian genetics and deviations, gene linking and mapping. Structure and DNA replication, gene expression (transcription and translation). Chromosome expression (euploid, aneuploid), extrachromosomal inheritors. Setting the gene activation (operon system, dead type). Genetic a nature of the metrics. Sex determination and differentiation.

Basics of Plant Breeding (PNB 2221; 2/1)

Life cycle and plant reproduction, flower growth, pollination, and fertilization. Plant diversity, domestication, and introduction. Basic genetics of plants. Basic methods of plant breeding, understanding heritability and advancing selection. Seed production and seeding, variety protection.

Molecular Genetics (PNB 3114; 2/0)

Principles of molecular biology; molecular gene structure: the basis of mutations, protein synthesis systems, gene material structures, citrons, mutons, recon. Gene-regulation, regulation process, cytoplasmic genetic system, gene differentiation and regulation.

Plant Breeding Method (PNB 3121; 2/1)

Strategies in plant breeding, how to obtain new improved varieties, the implementation of plant breeding self-pollination and crossbreeding (advantages and disadvantages for each method).

Calculation of heritability of offspring variants and variant components, realized heritability, selection progress, estimation of general and special combining forces. Outline of plant breeding specifically.

Introduction to Biotechnology for Plant Breeding (PNB 3222; 2/0)

The history of the development of biotechnology and its role in plant breeding. In vitro breeding, *somaclonal* variation, embryo rescue, in vitro fertilization, somatic cell fusion. Mutation induction, chromosome transplantation. Transformation of vector genetic. DNA isolation, DNA cutting and attachment, gene organization analysis techniques and expression in plants. Isoensim, nitrate reductase, electrophoresis staining method, polymerase chain replication.

Experiment Design (PNB 2141; 2/1)

Homogeneity test of two variants (F distribution), sample theory for the homogeneity test of many averages and analysis of variance. Understanding in experimental design, linear models (perfect random, complete block random, latin square), assumptions in analysis of variance, testing, and transformation of data, comparison between means (unstructured, orthogonal comparison, trend analysis). Factorial experiments, notions of treatment vs. treatment design environmental design, simple influence, main and interaction. Random, sure, and mixed models. The treatment plan is based on primes. Split plot experiments, repeated observations, and variations. Covariance Analysis.

Introduction to Quantitative Genetics (PNB 3213; 2/0)

The scope, basics of plant breeding, frequency of genes, gametes, genotypes and influencing factors.

Genetic effects and ways of estimating them, relationships between genes, crossing design, heritability, types of selection, G x E interactions, and genetic analysis.

Seed Technology (PNB 2231; 2/1)

An understanding of the science and technology of seeds, the scope of their orientation. The role of seed technology in agricultural development needs, situations, and seed problems in Indonesia. Seed germination, seed production techniques, drying, processing, testing, storage, packaging, quality control and certification of seeds, seed distribution and agribusiness in the field of seed.

Seed Physiology (PNB 3132; 2/1)

Understanding the meaning of the essential seeds of seeds and their limitations. Understanding of the biology of interest; seed growth and development; seed structure; ripening seeds; physiology of germination and growth of seedlings, formation and refinement of carbohydrates, proteins and fats; deterioration seeds; seed dormancy and characteristics of orthodox and recalcitrant seeds.

Seed Management (PNB 3233; 2/0)

Introduction: important understanding and role of managing seedlings, national seed needs and current and future problems.

Seed system: institutional, operational, procurement and partnership aspects. Seedling program: procurement of seed sources up to scattered seeds, new varieties, seed distribution and marketing, seed quality control, seed regulation. Seed forum by seed practitioners and business partners and the need for seed service centers.

3. PLANT PEST AND DISEASE SCIENCE STUDY PROGRAM

Plant Protection Basics (PNH 2110; 2/0)

An understanding of the meaning of the inner protection of plants

development. Understanding of pests, pathogens, and weeds. The basics of plant-destroying bioecology. The development of plant protection concepts and systems and their impacts and implications: eradication, control and management. Economic considerations in crop management, strategies and tactics. Crop protection policy and actual problems.

Basics of Plant Pest Science (PNH 2220; 2/1)

Plant and pest interactions; estimation of yield loss and control threshold; ecological foundation for pest management; observation and sampling; basic elements and components of IPM; control with resistant varieties; the development of transgenic plants, plant quarantine; biological control of chemical control; pest management of food crops, horticulture, plantations and post-harvest; plant protection policy.

Basics of Plant Disease Science (PNH 2230; 2/1)

Discussion of the importance of disease, the development of disease concepts, and types of disease-causing (pathogenic) plants. Plant interactions with pathogens in the cells, tissues, and plant populations. Influence of external factors on disease. Diagnosis and method of disease management. Examples of plant diseases that have meaning

Plant Pathogens (PNH 3150; 2/1)

Introduction of types of biotic disease causes (fungi, prokaryotes and molicutes, sub-microscopic organisms, nematodes, protozoa, algae and plant parasites). Discussion of the types and causes

of abiotic pathogens. Diagnosis and identification methods used in studying pathogens.

Plant Pest Identification (PNH 3140; 2/1)

Introduction of plant pests based on morphological, bioecological (ways of living, distribution, destructive) and economic descriptions (damage and losses caused) as a basis for their management

Management of Plant Pests and Diseases (PNH 3280; 2/1)

Basics of integrated pest and disease management (PH-PT). Introducing the application of pest and disease management systems in food crops-plantations- and horticulture from pre-planting to harvest. Management of Post-Harvest Pests and Diseases (PNH 3290; 2/1)

Discussion of the characteristics of post-harvest products and the quality required in the era of global trade. Types of pests and pathogens after harvest as well as damage and losses that are caused. Factors that influence the development of pest populations and disease occurrence. Post-harvest pest and disease management system.

Plant Ecology Pest and Disease (PNH 3160; 2/1)

Discussion of the concept of a plant destroyer. Macro and microenvironments that affect the life and development of pests and plant pathogens. Interaction between bodies in the environment. Population dynamics of pests and pathogens and their control.

Plant Protection Policy (PNH 3270; 2/0)

Discussion of policies, structures, and functions of crop protection institutions at national and global levels. Development of a strategic plan for implementing and developing plant protection programs. IPM implementation through SLPHT and independent farmers, global conventions on crop protection, pesticides, and sustainable agriculture.

Agricultural Pesticides (PNH 3292; 2/1)

Discussion on the definition of pesticides: classification of pesticides according to active ingredients, target pests, formulations, ways of entry, and ways of working. Pesticide application techniques. Impact of pesticides on target, non-target, and environmental bodies. Pesticide management which includes licensing, use and safety.

Biological Control (PNH 3291; 2/1)

Discussion on the definition of biological control (PH), PH as a major component of integrated pest management (PHT), the relationship between PH and the quality of agricultural products required in the era of global trade, the history of PH. Natural enemies and biological control agents (APH), plant pathogenic pests and weeds. Plant ecosystems and APH potential control pests, diseases, and target weeds. PH techniques, how to evaluate PH programs and examples of PH in practice.

Introduction to Plant Virology (PNH 3284: 1/1)

Discussion of the physical and biochemical characteristics of viruses as plant pathogens. Various methods of detection and diagnosis. Mode of transmission and spread of viruses. Multiplication and pathogenesis of plant viruses. Ecology, epidemiology, and management of viral diseases. Examples of viral diseases in Indonesia.

Introduction to Agricultural Mycology (PNH 3282; 1/1)

Mycological development and the important role of Fungi. Fungal bioecology concerns growth, nutrition, the macro and microenvironment and the relationship of fungi to other bodies Introduction

of fungal characteristics based on toxin groups: Mycomycetes, Phycomycetes (Chytridiomycetes, Oomycetes, Zygomycetes and Plasmodiophomycetes), Ascomycetes, Basidiomycetes and Deuteromycetes. Management of fungi that is harmful and beneficial to humans.

Introduction to Plant Pathogen Prokaryotes (PNH 3283; 1/1)

Discussion of morphology, physiology, and genetics of prokaryotes. Classification of plant pathogenic prokaryotes. How to survive, spread, and pathogenesis. Diagnosis of the disease caused and how to manage it.

Agricultural Nematology (PNH 3281; 1/1)

Discusses the importance of nematodes in agricultural ecosystems. Morphology, classification, bioecology, and management of parasitic nematodes are important. Use of nematodes instead of plant parasites in support of sustainable agriculture.

Introduction to the Epidemiology of Plant Diseases (PNH 3153; 1/1)

Limitations and scope of epidemiology. Discussion on the dynamics of the pathogen population in space and time, and the pathogen-scattering pathways. The pattern of disease distribution and development in the field follows the factors that affect it. Introduction to the application of epidemiological principles in the management of crop diseases.

Plant Protection Biotechnology (PNH 3161; 2/0)

Discuss various biotechnology methods for pest and disease management. Genetic engineering to produce resistant plants and other control agents. Risk analysis and biological safety.

Vertebrata Hama (PNH 3142; 1/1)

Discussion of the importance of pest vertebrates. Classification of vertebrate pests. Morphological, biological and ecological characteristics of various types of vertebrate pests. Control Strategy.

Seed Pathology (PNH 3152; 1/1)

Discussion of the importance of seed health in agriculture. Types of pathogens carried by seed. The mechanism of development and transmission of pathogens in plants to seeds, and seeds to plants. Ways of testing seed health. Management of seed-producing plants, seed storage and seed treatment.

Plant Quarantine (PNH 3163; 2/0)

Definition of quarantine, the importance of quarantine in cross-crop trade, agricultural production at national and international levels. Regulations and producers of Sanitary and Phytosanitary (SPS) instruments, pest risk analysis, and international cooperation.

Pest and Disease Plant Observation Techniques (PNH 3162; 2/1)

Definition and the importance of observation in the management of pests and plant diseases. Sampling techniques: advantages and disadvantages, use, dispersion index analysis. Observation techniques: absolute and relative population, pest population index and assessment and disease intensity (indexing and scoring).

Biology of Plant Parasite Nematodes (PNH 3151; 1/1)

Definition of biology as a basis for management of plant parasitic nematodes which includes the life cycle, reproduction, distribution and dispersal, interaction of nematodes with plants, adaptation to parasitism, environmental factors, and integrated nematode management.

Apiology (PNH 3273; 1/1)

Discussion of the biological and ecological aspects of honeybees, the factors that influence the development of honeybee ecology. Maintenance techniques and the benefits of honeybees for agriculture and health

Basic Entomology (PNH 3141; 2/1)

Discusses the importance of insects in nature. Study the structure and function of body organs to understand growth, development, and behavior. Classification, identification, and geographic distribution of insects.

Mass Insect Breeding (PNH 3274; 1/1)

Discussion of the purpose and benefits of insect bulk breeding (PMS), insectarium management, insect nutrition, and PMS methods.

Special Issues on Plant Pest and Disease (PNH 3165; 0/1)

Study the actual problems of pests and diseases.

Akarologi (PNH 3272;1/1)

Taxonomy, morphology, and bioecology of rootine. Examples of plant pests from the Acari subclass and how they are managed. The role of rootine as an agent for biological control of plant pests.

Insect Pathology Basics (PNH 3271; 1/1)

History, development and role of insect pathology. Interaction of microorganisms with insects. Pathogenesis and insect immunity. Epizooti and the use of microorganisms in biological control. Current issue of insect pathology.

Plant Clinic (PNH 3164; 0/1)

Diagnosis of plant damage by macroscopy and microscopy. OPT control recommendations. How to return and package samples to be sent to the laboratory. Making preparations and cultures.

Seminar (PNH 4085; 0/1)

Curricular program development of insight, experience, and scientific knowledge and practices of students through the delivery of a literature study or the results of researchers in the form of papers by way of organized discussion/discussion.

4. AQUACULTURE STUDY PROGRAM

Introduction to Fisheries and Marine Sciences (PIU 1101; 2/0)

Introduction of the scope of fisheries and marine activities. Fisheries Science Understanding as a multi-disciplinary field of study whose discussion covers the potential, utilization, and management of aquatic and fisheries resources. Post-harvest problems, socio-economic and cultural fishing communities, the role of fisheries in community life and national development. The potential of marine resources and their role in community life and national development.

Aquatic Avertebrata (PIB 1151; 2/1)

Classification, structure and function of aquatic avertebrata organs, their lifecycle in aquatic ecosystems and their use in fisheries.

Iktiologi (PIB 1252; 2/1)

The structure and function of organs, systematization and fish eco-biology related to their lives. The ability to adapt to aquatic ecosystems, as well as the behavior (distribution and reproduction) of fish.

Soil and Fisheries Irrigation (PIB 2114; 2/0)

Study the general nature of soils (physics, chemistry and biology) and the properties of stagnant soils (the relationship between soil and water); soil type, distribution and nature of its creator; land use and suitability for fisheries (ponds, ponds and mina-rice); land topography, water infiltration and surface water flow; water cycles and sources, water quality standards; water management (irrigation and drainage) for fisheries

Marine Biology (PIB 2154; 2/1)

The limits and scope of marine biology and the distribution of biota in various marine ecosystems. The peculiarities of biota are highlighted in relation to the peculiarities of ecological conditions. Mechanisms for biota adaptation to ecological conditions. Primary productivity of marine ecosystems.

Basics of Aquaculture (PIB 2211; 2/0)

Definition and the scope of aquaculture; the role of aquaculture in the preservation of fishery resources and human needs and development (SWOT analysis); selection of aquaculture sites and aquaculture requirements; introduction of species of animals and aquatic plants that are cultivated; irrigation sources, aquaculture containers and aquaculture technology; aquaculture management.

Physiology of Aquatic Animals (PIB 2253; 2/1)

Limits and scope of Physiology. Comparison of land animals and aquatic animals. The mechanism of osmoregulation, circulation, respiration, digestion, reproduction, conditions and endocrine in fish and shrimp. Metabolism and bioenergetics.

Fish Feed Nutrition and Management (PIB 2231; 2/1)

Definition and concept of fish nutrition, including protein, fat, carbohydrates, vitamins, and minerals in relation to the anatomy and physiology of fish digestion and metabolism. The basics of feed manufacturing techniques, including the procurement of feed ingredients, preparation of feed formulations, feed processing, quality control of feed and feed management as well as the basics of fish feed management, including the amount and dosage of feeding, frequency and time of feeding, place and infrastructure feeding related to integrated effects of cultured fish species, quality of aquaculture media and types of aquatic biota.

The basics of Genetics (PIB 2241; 2/1)

The life cycle of fish and aquatic animals, swelling and deviation genetics, DNA linking and replication, gene expression, chromosome expression, regulation of gene activity.

Introduction to Fishery Biotechnology (PIB 2244; 2/0)

The history of the development of fisheries biotechnology, the basic principles of life at the cellular level, the synthesis of RNA, protein and genetic dogma. Some molecular biology techniques used in biotechnology are also discussed, namely electrophoresis, PCR, genetic engineering, and blotting. Application of biotechnology in the field of fisheries using existing examples, regulations on the use of

biotechnology products, safety in the development and use of its products

Water Quality Management (PIB 3113; 2/1)

Understanding (basic, techniques and concepts) water quality management; water quality criteria for aquatic biota cultivation; water quality management, chemical and biological; relationship between nutrient status, fertility, development of plankton and aquatic plants in the cultivation system; fertilizing, liming, fixing water quality (probiotics); transformation of organic matter, dissolved oxygen requirements, and water aeration; aquaculture waste management.

Natural Feed Cultivation (PIB 3133; 1/1)

A description of the scope, nature, and types of natural food. Structure and role of plankton (phytoplankton and zooplankton) in aquaculture. The technique of natural feed culture in freshwater, brackish water and sea water media, the problems, and their role in the fishing business. Ways of providing natural food in various types of aquatic biota cultivation

Fish parasites and diseases (PIB 3121; 2/1)

The history of fish diseases in the world and Indonesia, the limits and scope of fish diseases, the negative impact of the disease on fish farming. The process of disease occurring as an interaction between the environment, host, and pathogen. Symptoms and characteristics of parasites that attack fish and shrimp. Koch's postulate, symptoms of fish with bacterial disease. Biophysical, biochemical and antigenicity *cataretristics* of Aeromonas, Vibrio, Streptococcus, Mycobacterium. Introduction to virology which includes characteristics, culture, mechanism of propagation, purification of viruses. Symptoms of fish and shrimp that are attacked by viral diseases, biophyte characteristics and viral genetic due to shrimp and fish diseases.

Genetics and Fish Breeding (PIB 3142; 2/1)

Definition and the scope of genetic science as a basis for breeding. The role of fish breeding in increasing aquaculture production and seed production. The principles and methods of fish breeding, engineering, and gene conservation.

Aquaculture Engineering (PIB 3213; 2/1)

Understand and scope; hydro-topographic and soil conditions survey, land mapping for aquaculture; assessment and selection of aquaculture locations; design of containers or places and facilities for aquaculture; aquaculture technology engineering (use of probiotic and bio-fl) and fish transportation; recirculation system: biological carrying capacity, containers and assistive devices, and their management.

Freshwater Aquaculture Management (PIB 3115; 2/1)

Study the management of various freshwater aquaculture systems and technologies; business management starting pre-production, production and post-production of various freshwater biota aquaculture systems; integrated aquaculture (integrated aquaculture) and seed procurement; fish sampling and water quality; handling and transporting the results, analysis and evaluation of the freshwater aquaculture business, its problems and development prospects.

Brackish Aquaculture Management (PIB 3216; 2/1)

Studying various systems and technologies for brackish water biota cultivation; business management starting pre-production, production and post-production of various cultivation

techniques in brackish waters; fish sampling and water quality; product handling; analysis and evaluation of brackish aquaculture business; problems and prospects for development.

Mariculture Management (PIB 3217; 2/1)

Studying the management of various systems and technologies for aquatic biota cultivation; business planning starting from commodity selection and cultivation location; techniques and management of aquatic animals and plants, sea ranching; seed procurement and handling; product handling, analysis and evaluation of mariculture business; problems and prospects for development.

Plankton and Aquatic Plants (PIB3256; 2/0)

The structure and role of plankton and aquatic plants in aquatic resources. Classification, distribution, adaptation and succession of plankton, bacteria, protozoa, bacteria and aquatic plants. Quantitative and qualitative analysis methods and biotic composition.

Fish Health Management (PIB 3222; 2/1)

Limits and scope of fish health management. Fish defense system (nonspecific and specific), Molecular disease detection based on genetic and immunological materials. Disease control through environmental management and bioremediation. Drug ingredients and treatment of parasitic and bacterial diseases. Increased disease resistance through vaccination of immunostite and probiotics. Epidemiology and quarantine.

Ornamental Fish and Aquatic (PIB 4118; 1/1)

Economical ornamental fish culture important techniques; biological characteristics, seed production and enlargement; the design and layout of ornamental fish farming containers/containers; assistive devices (accessories) and cultivation facilities; care of ornamental fish farming.

Aquaculture Environmental Management (PIB 4219; 2/0)

Definition and scope; the relationship between aquaculture and the environment; regional master plan and land use, minapolitan; environmental carrying capacity (fi, production, ecology and socio-economy); Layout and design of aquaculture; accessibility, facilities and infrastructure for cultivation; the effects of climate change; cultivation waste management and management (PAL).

Histology (PIB 4156; 1/1)

The scope of histology, types of tissue, anatomy of fish and shrimp, tissue structure in the bone and muscle system, circulation, respiration, digestion, excretion, reproduction and nerves of fish and shrimp. Basic techniques for preparing preparations (dehydration, clearing, slicing, and staining). Histopathology in fish and shrimp.

Seed Technology and Management (PIB 4403; 2/1)

Spermatogenesis, vitellogenesis, fertilization and embryogenesis. The role of hormones and the environment in fish breeding. Parent breeding techniques, spawning, egg incubation and handling and maintenance of fish larvae/seeds. The design of the production process and the selection of freshwater, brackish and sea fish hatchery technologies. Seed production management, business analysis and seed business evaluation.

Field Work (PIB 4080; 0/2)

Curricular program development of insight, experience and improve student skills through learning

programs while working on an activity/piece of activity and programs/businesses in the field of Fisheries in the broad sense managed by government, private or individual institutions. Work while learning programs are carried out in accordance with the fields/interests in the Aquaculture Study Program.

Seminar (PIB 4085; 0/1)

Development of students' insights, experiences, and scientific and practical knowledge through the writing and delivery of an up-to-date topic that is the result of a literature review or research result. Topics are written in the form of papers and presented to students and lecturers. The topic of the seminar is in accordance with the field/interest in the Fisheries Cultivation study program and each student is accompanied by a supervisor.

Thesis (PIB 4090; 0/6)

Development of students' insights, experiences, and scientific and practical knowledge through an organized research process, with a thesis guidance and examination pattern. Thesis is a scientific paper produced by students and researchers who are accompanied by supervisors according to their fields/interests in the Fisheries Cultivation Study Program.

FISHERIES RESOURCE MANAGEMENT STUDY PROGRAM

Aquatic Ecology (PIM 1211; 2/1)

Definition and principles of ecology, limiting factors in aquatic ecosystems; biogeochemical cycles, energy flows, population changes, and aquatic communities; succession, typology and ontogenic processes of aquatic ecosystems; river ecosystems, lake ecosystems, estuary ecosystems, and marine ecosystems (especially tropical marine ecosystems); and the application of aquatic ecology in fisheries resource management.

Fishery Sociology (PIM 1231; 2/0)

Definition and scope of fisheries sociology; type of community or community whose life depends on the use of fisheries resources, fishermen's history and culture, social institutions and community institutions; comparison of the situation of fishermen in various countries and their technology; and the role of fisheries sociology knowledge in fisheries resource management.

Limnology (PIM 2112; 2/1)

Understanding and scope of limnology; structure of aquatic ecosystems (lakes, rivers and estuaries); fi, chemical and biological properties of lenti climatology waters and the influence of climate on lentik waters; morphology and morphometry; hydrological cycle, and water balance; hydromechanical, thermal and thermal properties; dissolved oxygen, carbon dioxide, acidity (pH), alkalinity, hardness; organic matter and nutrient cycles (nitrogen, phosphorus, etc.); organisms (phytoplankton, zooplankton, benthos, aquatic plants, fish) and population dynamics in tap waters; aquatic biological productivity (primary productivity, secondary productivity and eutrophication); and special characteristics of tap waters (ponds and reservoirs).

Oceanographic (PIM 2213; 2/1)

Bpundaries and scope of oceanography; a description of the geological, physical and chemical aspects (salinity, macro and micro elements, organic matter content) of the seabed and water bodies; and the relationship between physical and chemical factors on the life of marine life; the basics of hydrodynamics (currents, waves, tides) sea waters; climatology and climate influence on sea waters; and basic oceanographic research techniques.

Fishery Biology (PIM 2122; 2/1)

History and scope of fisheries biology; differences in fish biology and fisheries biology; the basics of biological knowledge that will be applied in fisheries which include taxonomic knowledge and identification, distribution and habitat requirements, feed and eating habits, growth, reproduction, life history and behavior of various fish commodities; and the application of fisheries biology in resource management and aquaculture.

Basics of Fishing (PIM 1221; 2/0)

A description of the scope of fishing activities, classification and introduction of techniques for making and repairing fishing gear; introduction of assistive devices and capture areas; fish species and populations; and introduction to fishing techniques and methods with various types of fishing gear.

Fish Population Dynamics (PIM 2224; 2/1)

The concept, limits and identification of populations and stocks and their benchmarks; estimation of growth, rejuvenation (recruitment), natural mortality and capture measures; stock estimation methods, fishing gear selection curves; Surplus Yield Models, Dynamic Pool Models, and the concept of sustainable use of fish resources.

Introduction to Fishery Economy (PIM 2232; 2/1)

Definition and scope of fisheries economics; common features of fishing communities and fish farmers; institutional, stratification, organization and socio-economic changes of fishermen and fish farmers; the role of waters/land, capital, labor in fisheries production; demand and marketing of fishery products; income-expenditure, and financial management of the fisheries/fishermen community; price formation in various markets; the effect of taxes and subsidies on the production market; factors of production and efficiency; profit-sharing system; socio-economic problems of the fisheries/fishermen community, as well as basic techniques of fisheries socio-economic research

Aquatic Ekotoxicology (PIM 3114; 2/1)

Understanding and scope of aquatic ecotoxicology; sources, types and effects of aquatic toxicants; physical transformation, chemical transformation, and biotransformation and their effects on the components of aquatic ecosystems; aquatic toxicity testing and its benefits in risk assessment and management of aquatic environments.

Aquatic Pollution Control (PIM 4115; 2/0)

Definition and scope of pollution; impacts and indicators of water pollution; water environment quality standard; controlling water pollution; wastewater treatment; and management of polluted water resources for fishing businesses.

Fishing Gear Material (PIM 3126; 2/0)

An understanding of the type, classification, and material characteristics of textile fibers as a net material; numbering and construction of yarn, twine, and cord systems as well as calculations and testing methods for the physical properties of net material; how to care and preserve materials and fishing gear.

Introduction to Geographic Information Systems (PIM 2123; 2/0)

Definition of remote sensing (PJ) and geographic information systems (GIS); historical development of remote sensing; recording system, type and interpretation of remote sensing data;

GIS data source, management and analysis; and the use of PJ and GIS techniques in water and fisheries resource management (capture and cultivation).

Fishing Techniques (PIM 3125; 2/1)

Definition and classification of fishing gear; the form and method of manufacture and the characteristics of traditional and modern fishing equipment; important fishing technology developments in Indonesia and possible development; introduction of ways of fishing operations in public waters; the introduction of fishing vessels, as well as the introduction of the role and function of fishing ports as a fishing operation base.

Fishing Instrumentation and Navigation (PIM 3227; 2/0)

Introduction of conventional work tools in fisheries/marine activities; introduction of satellites and sensing devices (radiometry, radar and laser photography systems) to fisheries/marine activities; the working principle of the underwater vehicle (under water vehicle); introduction to the basics and applications of shore and sea navigation (maps, compasses, and other navigation tools, and ship positioning).

Fisheries Data Processing (PIM 3133; 2/1)

Fisheries data collection, processing and presentation techniques; introduction of computers and exploitation systems; mastery of word processing packages and data bases, and examples of their application in the field of fisheries; introduction and Definition of basic languages and data base programs; and making simple programs for fisheries data processing.

Fisheries Resource Economics (PIM 3236; 2/0)

Definition of and economic scope of fisheries resources; application of economic ideas and concepts to fish resources; production function; resource diversity and the relationship between several factors of production, conservation issues and exploitation of fish resource utilization (MSY, MEY and OSY); cost-benefit, risk and uncertainty analysis in the production and management of fisheries resources.

Fisheries Agribusiness Management (PIM 3235; 2/0)

Definition and scope of agribusiness management and fisheries business; influencing factors in fisheries agribusiness; the concept of producer-trader-consumer relations; problems and strategies in fisheries agribusiness; and institutional and regulations in fisheries agribusiness. Basic analysis of farming, income analysis, cost and revenue structure and financial and economic analysis parameters.

Fisheries Business Feasibility Study (PIM 3134; 2/0)

Definition of the feasibility study, its purpose and purpose; definition of the types of costs and benefits; assessment with criteria of technical, market, management (organizational), economic and financial aspects.

Water Resource Management (PIM 3141; 2/1)

Definition and concept of water resource management; evaluation of water resources potential and habitat suitability; fertility control, water restoration and rehabilitation; habitat management, crop/water weed control, utilization of aquatic resources (including aquatic ecotourism), and conservation of aquatic resources.

Field Work(PIM 3080; 0/2)

Curricular program development of insight, experience, and knowledge of student practice through learning programs while working on an activity/piece of activities and programs/businesses in the field of Fisheries in the broad sense managed by institutions or individuals. Work while learning programs are carried out in accordance with the field/interest in the Fisheries Resource Management study program.

Seminar (PIM 4085; 0/1)

Development of students' insights, experiences, and scientific knowledge and practices through the delivery of a literature study or the results of researchers in the form of papers by organized discussion. Seminar papers are in accordance with the fields/interests in the Fisheries Resource Management study program and must be delivered by students in front of students and lecturers.

Thesis (PIM 4090; 0/4-6)

Development of students' insights, experiences, and scientific and practical knowledge through an organized research process, with a thesis guidance and examination pattern. Thesis is a scientific paper the results of studies or observations compiled from the results of researchers according to the field/interest in the Fisheries Resource Management study program.

Fisheries Business Planning (PIM 3237; 2/0)

Definition/boundary and scope, fisheries business planning; assessment of technical, economic, socio-cultural aspects and its supporting businesses both small and corporate fisheries; regulation, forecasting risk factors and uncertainties.

Fishery Product Trade Administration (PIM 4138; 2/0)

Marketing basics, covering the basic concepts, functions, processes, institutions and marketing channels; concept of price and cost; nature of supply and demand for fisheries products; nature of marketing of fishery products; government policies and roles; marketing improvement strategies; international trade, and marketing studies.

Fisheries Resource Management (PIM 3242; 2/1)

Evaluation of the potential and level of utilization of fish resources; principles of control, arrangement and regulation of rational use of resources; utilization of fisheries resources utilization; regulations (positive and traditional custom regulation) in fisheries resource management and fisheries business spatial planning; sea law and international conventions related to national interests (Indonesia's Exclusive Economic Zone); and various management applications for fisheries resources (Co-management, Community Based Fisheries Management, Community Based Coastal Resource Management).

Conservation of Fisheries Resources (PIM 3243; 2/1)

Definition and concept of conservation; laws and regulations in the field of conservation of fisheries resources; spatial planning and management of fisheries resources in fresh, coastal and marine waters in relation to the objectives of protection and preservation; behavior and strategy for adaptation of demographic fisheries resources; habitat restoration; and the principles of conservation management.

Environmental Impact Analysis (PIM 3245; 2/0)

The Analysis of the Environmental Impacts (ENVIRONMENTAL IMPACT ANALYSIS); history of ENVIRONMENTAL IMPACT ANALYSIS processes, laws and regulations in Indonesia; the impact of activities on the environment, ENVIRONMENTAL IMPACT ANALYSIS methodologies and techniques;

ENVIRONMENTAL IMPACT ANALYSIS preparation in the field of water/fisheries and other natural resources; the relevance and benefits of ENVIRONMENTAL IMPACT ANALYSIS in sustainable fisheries development; and the principles and benefits of the environmental approach in fisheries resource management.

Fisheries Development (PIM 3244; 2/0)

Theories and schools of thought (schools of thought) in the development and development of fisheries; the position of the fisheries sector in the national economy; fisheries development strategies and policies; the role of the state, private sector and cooperatives in fisheries development; and problems in fisheries development.

Iktioplankton (PIM 3146; 2/0)

History of early fish life development, ontogeny and evolution of larval growth, juveniles and adult fish, systematic procedures, zoogeography, habitat and adaptation, Predation, Growth, Mortality, larval research methods, identification techniques and analysis of fish larvae.

5. FISHERY PRODUCT TECHNOLOGY STUDY PROGRAM

Fish Technology Basics (PIT 2111; 2/0)

Introduction of fish resources as food and raw materials for the fishery products industry. Physical and chemical properties of fish, nutritional value, changes in post-decay of fish, deterioration of fish quality and the factors that influence it. Fish microbiology. The things that underlie the handling and processing of fish.

Fishery Product Quality Control (PIT 3125; 2/0)

The basics of quality control, including definitions and quality coverage. Quality program organization. Quality control of raw materials, production processes and final products. Sanitation and hygiene. Microbiological indicators in processing fishery products. Quality control statistics.

Chemical and Biochemical Fisheries Products (PIT 2223; 2/1)

Enhancing students understanding ability on fisheries biochemical aspects: (1) chemical structure and composition of fishery products, (2) chemical components forming fish meat, (3) the role of water and enzymes in the biochemical process of fishery products, (4) forms of fish food biochemical damage, (5) the deterioration process of the quality of fishery products, (6) changes in the biochemical nature of post-capture fisheries (during handling, preservation and processing), and (7) chemical components indicators of fishery product quality degradation

Microbiology (PIT 1221; 2/1)

Microbiology Basics. Various types of structures and cell activations: nutrition, microbial growth, and the importance of various major groups of microorganisms, especially bacteria.

Refrigeration of Fishery Products (PIT 2112; 2/1)

Material and energy balance, heat conduct theory. The definition of refrigeration in the field of fisheries, design of various freezers and cold storage, cooling and freezing methods, the effect of refrigeration and freezing on the properties, product chemistry, refrigeration on board, storage and distribution of frozen products.

Food Analysis (PIT 2213; 2/1)

Underlying theories and practices of proximate analysis such as water content, protein, fat, carbohydrates, and ash content for food from aquatic biota. This includes testing the salt, vitamins and minerals of the ingredients.

Fishery Product Handling (PIT 3115; 2/1)

Handling of fishery products in order to maintain the freshness of fish from harvest to consumers, techniques and facilities needed at the harvest location, on fishing vessels, ports and transportation facilities required. Cold chain system. Indicator of freshness and deterioration of fish quality.

Material Layout and Handling (PIT 3116; 2/0)

Quantitative and quality factors in determining plant location, capacity planning, flow and material handling and linkages between activities. Layout techniques based on the type of operation, determining the number of machines, workplaces and area and layout evaluation techniques.

Thermal Process of Fishery Products (PIT 2212; 2/1)

Discussion and understanding of the basics of processing engineering and preserving fishery products using heat, which includes drying and canning. Thermo-bacteriology.

Fishery Product Processing (PIT 3217; 2/1)

Processing and preserving fish to prevent the risk of product damage to ensure consumer safety. Understanding the principles and processes of processing and preserving fish such as drying, salting, scavenging, smoking, fermentation, and others. Introduction of various fishery products and development efforts. Fisheries Industry Management (PIT 3219; 2/1)

A brief history of the development of management sciences and strategies to improve industrial performance (introduction), definition of and basics of fisheries industry management techniques that concern planning, organizing, staffing, controlling and coordinating, human resource management, production management, and marketing management in the fishery product processing industry.

Capita Selekta (PIT 4128; 2/0)

Discussing various actual issues of development and post-harvest development efforts of Fishery products.

Fish Nutrition (PIT 2123; 2/0)

Fish food as a source of nutrition, the use of food analysis lists, national nutrition problems, the effect of handling, preserving, and processing on the nutritional value of fish, the role of the fishing industry in efforts to improve community nutrition.

Fisheries Product Quality Testing Techniques (PIT 3218; 0/2)

The use of the nature of the senses of sight, odor, taste, touch, and interaction in a variety of sensory tests. Students practice various organoleptic tests. The practice of making HACCP, a case study in the home industry in fishery products. Use of statistics in quality control.

Fisheries Industrial Waste Management (PIT 3226; 2/1)

Improving the students understanding and reasoning about the handling of fisheries industry waste, which includes: (1) understanding and meaning of the matter of handling industrial fisheries waste (2) techniques for handling fisheries industry waste that are environmentally sound, (3) characteristics of fisheries industry waste, (4) water quality in the fisheries processing industry (biophysics criteria for water and water sources for the fisheries processing industry), (5) ways of handling water in the fisheries processing industry, (6) economic aspects of fisheries industry waste utilization, (7) analysis of the pollution load of the waste in the fishery industry, (8) the impact of disposal of industrial waste in water bodies on the quality and aquatic biota, (9) application of waste handling techniques towards improving the quality and diversification of fishery products.

Toxicology and Hygiene (PIT 4227; 2/0)

Hazardous substances in fishery products, the process of occurrence and how to prevent and overcome them.

Fishery Product Microbiology (PIT 3124; 2/1)

Microbes in materials and fishery products. The role of microbes in the preservation, processing and decay of fish. Factors that influence the role of microbes in fisheries. Microbiological quality identification of fishery products.

Field Work (PIT 3080; 0/2)

Developing the insight, experience, and knowledge of student practice through learning programs

while working on an activity/piece of activities and programs/businesses in the field of Fisheries in the broad sense managed by institutions or individuals. Working while learning programs are carried out in accordance with the field/interest in the Fisheries Product Technology study program.

Seminar (PIT 4085; 0/1)

Developing the insights, experiences, and scientific knowledge and practices of the students through the delivery of a literature study or research results in the form of papers by organized discussion. Seminar papers are in accordance with the field/interest in the Fisheries Product Technology study program and must be delivered by students in front of the students and lecturers.

Thesis (PIT 4090; 0/4-6)

Developing insights, experiences, and scientific and practical knowledge of the students through an organized research process, based on a thesis guidance and examination pattern. Thesis is a scientific paper as the results of studies or observations compiled from the research according to the field/interest in the Fisheries Product Technology study program.

6. SOCIO-ECONOMY / AGROBISNIS STUDY PROGRAM

Management Basics (PNE 1151; 2/0)

This course provides an understanding of how to manage an organization, especially companies. It includes the definition of management, management and organization, the role of managers, management theory, organizational environment, and management functions which include planning, organizing, mobilizing, supervising/controlling, and evaluating.

Agricultural economy (PNE 1221; 2/0)

The topics in this course are the basics of microeconomics and macroeconomics to study and explore the problems to cope with in the fields of agriculture, agricultural development, and economic development in general. It includes the basics of economic theory of production, consumption theory, marketing theory, agricultural/economic development, agricultural politics, and agricultural institutions.

Agricultural Business Management (PNE 2153; 2/0)

This course contains the basic definition and principles in agricultural business which includes the subjects of production, factors of natural production, factors of production, types of agricultural business, analysis of costs, income and profits, evaluation of agricultural business, relationships (relative relations) input-output, input-output, output-output and farm household budget analysis.

Entrepreneurship (PNE 2254; 2/0)

This course contains the notion of entrepreneurship, the importance of entrepreneurship, fostering an entrepreneurial spirit, assessing new business opportunities, profiles of successful entrepreneurs, formulation of vision and mission, motivation in entrepreneurship, business plan and management, and business negotiation techniques.

Research methodology (PNU 3104; 2/0)

This subject discusses the basic understanding of truth for researchers and scientific thinking. It also explains the stages/processes of the researcher formulating the problem, the research method of sampling, collecting, and analyzing data, writing scientific reports, and scientific ethics.

Application of Socio-Economic Research Methodology (PNE 3296; 0/1)

This subject is an application of the Research Methodology course. It compiles a research plan concerning agribusiness and agricultural development cases.

Agricultural Socio-Economic Study (PNE 3106; 0/2)

The assessment begins with a tutorial and continues with the field practice and making the report. The discussion in the tutorial is an introduction to the countryside, the principles of analysis of farming and welfare of farm households, distribution of production and consumption, analysis of agricultural resources, introduction of rural socioeconomic institutions, and special problems.

Microeconomics (PNE 2208; 3/0)

In this course, students study consumption theory, production theory, cost theory, market organization, general equilibrium, and welfare economics, with a graphical approach and calculus equation. Consumption theory studies about consumer balance which illustrates consumer behavior towards changes in prices, income, and other factors, thus producing an individual and market demand function. In production theory, it discusses the balance of producers in allocating the use of inputs and cost theory to reduce individual and market supply. Market organizations explain the balance of various market models characterized by the number of sellers and buyers, the homogeneity of goods and other factors as well as the short- and long-term balance. The input market is linked to various market models. General equilibrium with conditions of *Pareto opti* marginality and economic prosperity.

Mathematics Economics (PNE 2202; 3/0)

The courses contain applied mathematics, among others, set theory, static balance matrix analysis, derivative concepts, differentiation and usability, general function models in static analysis with their applications, optimization of one independent variable, exponential functions, logarithms and applications, optimization with more than one independent variable , optimization with constraints and integrals.

Macro economics (PNE 3104; 3/0)

Macroeconomic material includes (1) calculation of national income, (2) national income models, (3) consumption, saving and investment, taxes and subsidies, exports and imports, multi-analysis, financial and monetary policy (4) IS-LM model (Investment-Saving, Liquid-Money), (5), aggregate demand and supply (6) unemployment (7) economic growth.

Agribusiness Management (PNE 3155; 2/0)

This course contains a basic approach to studying management and management decisions in agribusiness companies. Each topic explains basic principles and concepts and then discusses the use of special tools to solve agribusiness management problems. In accordance with the areas of management responsibility, this course explains agribusiness financial management, agribusiness marketing management, agribusiness operations management, agribusiness human resource management. In the field of agribusiness management responsibility, the management functions include planning, organizing, directing and controlling.

Introduction to Econometrics (PNE 3105; 2/1)

This course introduces data types and measurements, empirical or quantitative analysis methods and their applications used in business and economic activities. The analysis model provided is a simple

regression model, multiple regression models, deviations of classical assumptions, matrices and their use and application models.

Introduction to Marketing Science (PNE 3107; 2/0)

This course teaches the definition and purpose of marketing, the difference between marketing and sales, elements of marketing activities, marketing environment, marketing functions, institutional and marketing channels, market structure, market analysis & marketing costs, market development and demand expansion, market information, marketing margin, marketing efficiency.

Agricultural Marketing (PNE 3157 ;2/1)

This course discusses agricultural marketing management which consists of the life cycle of agricultural products, the market environment, marketing strategies, market segmentation, promotion, consumer behavior and supply chain management.

Accounting Basics (PNE 2152; 2/1)

This course contains a basic approach to study the theories and basic principles of accounting and their application to companies in the fields of service, trade, and agricultural production. In this accounting basic course, the emphasis is on understanding financial accounting. The course material starts from the basic concept of the accounting cycle for making income statements, balance sheets, changes in capital and cash flow.

Financial Management (PNE 3263; 2/0)

This course provides basic materials for a financial manager in managing finances so that company goals can be achieved. This course covers the scope and focus of capital budgeting performance management, BEP analysis, internal and external funding sources, and case studies.

Human Resource Economics (PNE 3225; 2/0)

This course contains a basic approach to examining labor market mechanisms, labor supply and demand. It also discusses the mobilization workforce, Hedonic price theory, the goals of workers, the goals of employers and their balance, the Phillip curve (tradeoff between inflation and unemployment). Each topic applies basic principles and concepts, then the application of theory and application of policy.

Human Resource Management (PNE 3262; 2/0)

This course discusses HR planning, job analysis, selection, performance management, training, development and evaluation (including orientation, training and development, career planning and performance appraisal), compensation and protection (direct and indirect compensation including wages) , salary, benefits, safety, security and health), law and employment, employee relations and industrial relations.

Agricultural Development (PNE 3123; 3/0)

This course gives an understanding of growth, economic and agricultural development, the role of agriculture in development, agriculture in economic development theory, dualism theory, theory of development stages, theory of agricultural development, issues of food security, poverty, unemployment, and the environment.

Agricultural Politics (PNE 3127; 2/0)

This course studies public policy on agriculture starting from the public policy of farmer groups to the policy of national agricultural development and international trade based on the welfare of the

community, especially the farming community. This includes the things that underlie policies such as beliefs, values, goals, means, implement and constraints, as well as welfare criteria; Pareto opti consumer surplus, producer surplus and government revenue/expenditure, is associated with economic development and the nature of supply and demand with various examples of policies in various countries. Likewise, international trade policy in the era of globalization.

Cost Accounting (PNE 3160; 2/0)

This course studies the theories and principles of cost accounting and their application to companies. In this cost accounting course, the emphasis is on understanding and skills in preparing the cost of production (HPP), starting from the basic concept of cost accounting, determining the cost of production based on orders and processes, the elements of the HPP compilation namely starting from the cost of raw materials, labor costs and costs factory overhead (BOP) and cost control through estimated and standard costs.

Basics of Operations Research (PNE 3158; 2/1)

Operational research is a problem-solving technique that is related to the best decision making faced with resource constraints. Includes Linear Programming, graphical completion, linear programming, simplification, transportation, assignment, transshipment, CPM (critical path method), PERT (project evaluation and review technic), and inventory

Managerial Economics (PNE 3224; 3/0)

Application of economic theory (microeconomics) and analysis tools
decision making (mathematical economics, econometrics, and operations research) for the decision making of an economic organization to achieve its objectives as efficiently as possible.

Agricultural Cooperative (PNE 3261; 2/0)

This course covers the understanding of cooperatives, the history of the development of cooperatives in Indonesia and the world, the foundation, goals, functions, roles and principles of cooperatives, cooperative legislation, forms and types of cooperatives, cooperative membership, cooperative organizational instruments, cooperative management, application of economic theory in cooperatives , the formation and dissolution of cooperatives.

International Economics (PNE 3215; 2/0)

Study welfare theory, comparative advantage law (classical theory, neo-classical, modern), competitive advantage, opportunity cost and community satisfaction, international equilibrium, the Heckscher-Ohlin model, Leontief paradox, the link between economic growth and foreign trade, tariff theory, distortion and export import barriers, foreign exchange markets, balance of payments, devaluation effects, multi-level effects of foreign trade, floating exchange rates, the role of international institutions (IMF, AFTA, AFTA +, APEC, WTO, EU, Free Trade Area), the world economic crisis.

Natural Resource Economics and the Environment (PNE 3216; 3/0)

The topics of discussion are the understanding of natural resources, the application of welfare theory and benefit cost analysis in natural resource management, externalities and government policies, efficiency in the use of land resources, land valuation and compensation, land tax, land use planning, efficiency in resource use water, forest exploitation options, fishing options, utilization of mineral and energy resources, conservation and preservation of natural resources, pollution and environmental pollution, environmental impact analysis.

Regional Economy (PNE 3214; 3/0)

The role of agro-industry in the national economy, structure, behavior and market forces, determinants of industrial structure and company structure, sales strategy and product distribution, supply chain analysis, public policy for companies.

Agro-industrial Economy (PNE 3210; 3/0)

The role of agro-industry in the national economy, structure, behavior and market forces, determinants of industrial structure and company structure, sales strategy and product distribution, supply chain analysis, public policy for companies.

Agriculture Project Analysis (PNE 3156; 2/1)

The material provided covers the subject of the feasibility study, the feasibility study design, the technical aspects of the project, some analytical tools used, the calculation of the value of money based on time, investment appraisal and how to conduct financial and economic analysis of a project.

Agricultural Production Management (PNE 3264; 3/0)

This subject covers the procurement of inputs (production facilities, labor, capital, raw materials, energy), transformation processes (location, layout, process design, arrangement of production equipment, labor allocation, capacity planning, scheduling, technology selection) and supervision of outputs both quantity and quality.

Management Accounting (PNE 3159; 3/0)

This subject studies the various concepts, benefits and engineering of accounting information that can be used for planning, controlling, decision making; Such information is the need for management to do its work. The main subjects of this course are management activities, financial statements, cost classification and concepts, cost behavior analysis, variable cost accounting, cost analysis, profit/profit.

Economics of Agricultural Production (PNE3226; 3/0)

This subject studies economic theory related to the production of agricultural commodities. The material provided includes production of one input, differences in fixed inputs and variable inputs, The Law of Diminishing Return, marginal production and average production, Neoclassical Production Function, Elastical Production Bag, Cost Function, Duality of production and cost functions, Supply function, production with two inputs, Maximization of production functions without constraints and with constraints, Expanti path, Pseudoscale line, Economies of scale, various production functions and Risks

7. AGRICULTURAL COUNSELING AND COMMUNICATION STUDY PROGRAM

Agricultural Sociology (PNP 1201; 2/0)

This subject provides understanding on agricultural sociology; method of approach in studying agricultural sociology; agricultural structure; agricultural systems and land tenure; agricultural institutions; socio-cultural and economic characteristics of farmers; the characteristics of rural and urban communities; gender in development; agricultural development (sustainability, empowerment, and globalization).

This subject discusses the definition of sociology; the relationship between rural sociology, agricultural sociology and agricultural science; agricultural structure: culti shift, family farming and capitalist-commercial agriculture; agricultural systems and agricultural institutions: land tenure; social, economic and cultural characteristics of agriculture (peasant, subsistence, farmer); social structures and processes (value systems, social stratification, norms, social interaction, and social mobility); social change; agricultural development in the era of globalization (challenges of agricultural communities in the era of globalization): intensification and food security, poverty alleviation, sustainable resource management and climate change, globalization and market liberalization, gender mainstreaming in agriculture, multi-functional agriculture, agrarian reform and land use change .

Basics of Agricultural Counseling and Communication (PNP 2100; 2/1)

This subject includes the agricultural extension and communication; the development of agricultural extension and communication; theory, models (including Experiential Learning Cycle), management, and institutional agricultural extension and communication

Social Psychology (PNP 2204; 2/0)

This subject includes the definition, concept and object of social psychology; perception, attitude, and motivation; psychological aspects in social interactions/processes and social situations; individuals in social/community groups; group dynamics, and community influences on individuals; individual influence on groups and society.

Mass communication (PNP 2203; 2/0)

This subject discusses the definition, function and role, theories and models, forms and instruments of mass communication; mass media system; ethics of mass communication; media research; context analysis; mass media and development; news and information management.

Statistics of Social Sciences (PNP 3130; 2/0)

This subject discusses the definition of the application, and use of status for the social sciences; non-parametric and parametric Statistical tests for the social sciences; correlation and regression for social sciences, path analysis/path analysis.

Adult Education (PNP 3128; 2/1)

This subject discusses the definition and meaning of adult people education; its theories and principles; methods and techniques; evaluation; institutions and its role in agricultural extension.

Method of Agricultural Counseling and Communication (PNP 3129; 2/0)

This subject covers the basic approach in agricultural extension and communication; agricultural extension and communication methods and techniques; traditional and modern methods of agricultural extension and communication; the use of Information Communication and Technology (ICT) in agricultural extension and communication.

Social organization (PNP 3108; 2/0)

This subject discusses the definition of and elements of organization; principle and type of organization; forms of organization; organizational studies and effectiveness; communication and organizational culture; farmer organizations in Indonesia; organization and leadership; leadership patterns; prerequisites and aspects of the situation in leadership; group leadership.

Publishing Management (PNP 3110; 2/1)

This subject includes the definition of publishing management; types of publishing; publishing function in agriculture; techniques for writing agricultural publications; publishing in agricultural development; management and planning of agricultural publishing.

Photography in Agriculture (PNP 3109; 0/2)

In this subject, students learn the basic photography techniques; basic artistic aspects and journalistic photography for agricultural development programs; photo strengths and weaknesses; photo composition; creative engineering planning of the use of photography as a communication medium.

Verbal communication (PNP 3111; 2/0)

This subject discusses the definition of oral communication; interpersonal communication; group communication; organizational communication; public communication

Agricultural Counseling and Communication Program Planning (PNP 3212; 2/1)

This subject discusses the extension planning and agricultural communication; the reasons for the importance of planning; planning preparation; planning characteristics; elements of planning, steps in planning agricultural extension programs and communication.

Social Communication (PNP 3213; 2/0)

This subject discusses the definition of social communication; concepts of communication and social relations; social groups; social integration; social communication techniques. social integration network, interpersonal communication; group communication; traditional media; intercultural communication.

Application of Social Research Methodology (PNP 3214; 0/1)

This subject discusses about researchers and research proposals; the format of the research proposal with the quantitative identification approach , scientific writing techniques; problem identification and formulation; goals; setting literature review and selection of supporting theories; formulation of thinking framework and hypothesis; the basics of the sampling method; the basis for establishing data analysis techniques; reference writing.

Community Development (PNP 3224; 2/0)

This subject discusses the definition of community development; community development mechanism; dimensions of community development; community participation, innovation in development, concept of community development strategies, modernization theory, agro-industry in community development, poverty, and community empowerment; social capital in community development

Family Sociology (PNP 3216; 2/0)

This subject included the definition of family sociology; evolutionary, functional, institutional and economic approaches, and gender; family and family social environment as a social organization; the influence of external systems and changes in relations between families and institutions outside the family; family and household economy; the development of family labor in rural areas; time allocation and decision making; equality of the role of women in agricultural and rural development.

Human Ecology (PNP 3218; 2/0)

This subject includes the definition of human ecology, the concept of social systems

and ecosystems, various systems approaches in human ecology, adaptation and selection based on the study of biology and sociology/anthropology (morphology, behavior and culture), human interaction and the environment (social and biological), pre-village community ecology, rural society, sociocultural evolution and its causes, case studies of agricultural and rural development.

Group dynamics (PNP 3217; 2/0)

This subject includes the definition of groups and group dynamics; group structure; group cohesiveness; group pressure and norms; group leadership; group goals; group development; communication and decision making in groups; internal and external factors that affect the group; effectiveness and group productivity; measurement of group dynamics.

Social transformation (PNP 3219; 2/0)

This subject discuss the definition of social change and social processes; changes in population and community; theory of social change; the process of social change, sources of social change; dimensions and levels of social change; community response to social change; the impact of social change; modernization and economic development; the dynamics of the socio-economic structure of society; cases of social change in agricultural and rural development; social planning.

Agricultural Audio-Video (PNP 3215; 0/2)

This subject includes the Introduction to the principles of "moving pictures"; television production as an extension tool and communication; production basics; production techniques, and production planning.

Broadcast Management (PNP 3220; 2/0)

This subject includes the definition of broadcast media; broadcasting system and management; program strategy; broadcast media format; function and position of broadcast media in society; management of information broadcast programs; entertainment broadcasts and rural broadcasts; the main themes of broadcast media research.

Agricultural Journalism (PNP 3222; 2/1)

This subject discusses the definition of and concept of journalism; the concept and role of press institutions; journalist profession; journalism techniques; press publishing organization; design of agricultural journalism products

Public relations (PNP 3221; 2/1)

This subject includes the definition of the definition, history of public relations (PR); differences of public relations, publicity, and advertising; the role of communication in public relations, public opinion, organizational image and image type; the function of researchers in public relations, public relations organization, public relations program planning; introduction of the public situation in planning, PR ethics, public relations management in the case study of critics management in various public relations programs.

Advertisement (PNP 3223; 2/1)

This subject includes definition and theory of advertising; the strategy of arranging advertisements; economic dimensions of advertising; regulations and codes of conduct in advertising; and function and impact of advertising.

Administration of Agricultural Counseling and Communication (PNP 4125; 2/1)

This subject includes the concepts and administrative processes of agricultural extension and communication; human resource administration; organization administration; the role of

administration in development.

Evaluation of Program Agricultural Counseling and Communication (PNP 4126; 2/1)

This subject includes the definition, benefits, scope, principles and evaluation criteria of agricultural extension and communication programs; the evaluated aspects and the determining factors in the evaluation; evaluation types and designs, and agricultural extension and communication evaluation models; steps for evaluating agricultural extension and communication programs.

Special Problem (PNP 4227; 0/1)

This subject discusses the definition of the development of agricultural extension models and techniques, and communication through discussion of developing specific problems (cases).

Seminar (PNP 4085; 0/1)

Seminar is an activity of delivering a literature study or research results in the form of scientific papers within an organized discussion. Papers are written according to their fields/interests of Study Program of Agricultural Extension and Communication. Students are obliged to present it inf front of other students and lecturers.

8. SOIL SCIENCE STUDY PROGRAM

Basics of Soil Science (PN 1201; 2/1)

This subject examines the meaning and role of soil in human life; the definition of and scope of soil science to other sciences; soil formation and development; the soil components; rocks and minerals (types of rocks and primary mineral content, classification of mineral types, types and properties of clay minerals); physical, chemical, organism, and soil organic matter; basics of soil fertility and fertilization; basics of preservation (conservation) of soil and water; land use and classification in boar term; soil as a social and economic function.

Basic climatology (PNT 2122; 2/1)

This subject includes the introduction (history of development, meaning of meteorology and climatology, weather, and climate in its use in agriculture); the discussion about the atmosphere from aspects of the composition and profile of the earth atmosphere, solar radiation, air temperature and soil in relation to plants; examination of hydrometeorology in the forms of water, evaporation, humidity, clouds, rain. Air pressure is discussed in terms of determinants of variation and distribution of air pressure, the process of the occurrence of wind, turbulence, and local wind types. It also discusses various climate classifications in Indonesia and the world; the relationship between climate and plants, soil and pests; and the climatology/global climate change issues (global warming, climate anomalies).

Soil Chemistry (PNT 2213; 2/1)

In this subject students examines the components of the soil and associating with its chemical properties, clay mineralogy, permanent and changed loads on functional groups of soil material, soil organic matter, ion exchange, soil reaction (pH), soil salinity, soil oxidation-reduction; the processes of hydrolysis, acidolysis, complexolysis, humification, the formation of humic acid, fulvic, and humin.

Geology and Mineralogy of Soil (PNT 2204; 2/1)

This subject examines the composition of the crust layer of the earth and its composing elements, the formation of igneous rocks and primary minerals, sedimentary rocks, and the formation process, metamorphic rock types, weathering processes and indices, soil parent material

as weathering products (changes from saprolite rocks-soil materials- soil body), the soil resulted from the formation of 5 soil genesis factors, soil type, classification and application.

Fertility, Fertilization, and Soil Health (PNT 3115; 2/1)

This subject discusses the definition of soil fertility, its importance, and scope and its relationship with other sciences. Plant growth (growth curve, influencing factors, *law of minimum*, *law of the diminishing return*, nutrient concentration, influencing factors of nutrient mobility; the role and availability of nutrients in the soil (essential and pollutants), ; and soil ecosystem health, acidity and liming, evaluation of soil fertility, fertilizer and fertilization, fertilizer recommendations.

Soil Biology (PNT 3119; 2/0)

This subject discusses the interrelationships between living bodies that occupy the body of the soil with its natural and non-natural processes; biological life needs, factors that affect the life of organisms (macro or micro) in the soil; the role of biology in the process of formation and change of soil, and the environment as a whole.

Genesis and Soil Classification (PNT 3107; 2/1)

This subject includes introduction, weathering, transformation, and translocation processes, the role of humans in soil formation (soil genesis), formation of secondary minerals and their stability, colloidal soil, soil distribution, formation of diagnostic horizons, diagnostic horizon nomenclature and its specifications, soil classification, special soil genesis and classification, the implications of the practice of genesis and soil classification.

Plant Defense (PNT 3216; 2/1)

The discussion in this subject includes soil as a growing medium and nutrient provider for plants, nutrient absorption and assimilation, the relationship between plants and water, nutrition and plant growth; the qualitative effects of nutrient supply on plant growth, the concept of limiting factors, nutritional aspects of soil fertility studies, diagnosis of inheritance and excess elements, fertilizer application, mineral composition of plant tissue and quantitative nutrient requirements; macro nutrients (N, K, P, Ca, Mg, S), micro nutrients (Fe, Mn, Zn, Cu, B, Mo, Cl, Co); beneficial elements, nutrient interactions, studies of plant root systems, factors mechanically, chemically, bio-hydrologically affecting the root growth, culture techniques in plant nutrition studies, and toxic elements.

Soil Physics (PNT 3110; 2/1)

This subject discusses the definition of soil physics from various aspects: physics, soil science, and agriculture. Definition of the soil as a nest system (porous) and scattered (dispersed) phases (solid, liquid, and gas), along with their consequences. Components composing the soil material and some physical properties of soil, include the texture, structure, consistency, soil moisture, soil color, and others; the soil properties associated with the movement of water, air, dissolved substances in it, heat transfer, mechanical resistance in tillage, compression, carrying capacity of soil mechanics and penetration by plant roots, formation of aggregates, scattering of soil grains and the processes of wind and water erosion, sedimentation, landslides, etc.; methods for determining parameters of physical soil characteristics both in the laboratory and in the field.

Land Conservation and Reclamation (PNT 3112; 2/1)

This subject discusses the importance and issues in soil and water preservation. Efforts to cope with large scope damaged and deteriorated soil quality include applying the rules of conservation for all

human activities carried out on the land. Erosion problems are seen in terms of the processes, causes, forms and effects caused by erosion. Components that affect erosion include the rain, soil, plants (vegetation), and soil management. Restoration of damaged land due to human activities or naturally causes are carried out to restore the function of soil/land, for example ex-mining land, swamp land, land damaged by heavy pollution, etc., as before.

Relationship of Land, Water, Plants and Atmosphere (PNT 3211; 2/1)

This subjects discusses the soil, plants, and the atmosphere as a continuous system, mainly through water as the connecting medium (commonly called SPAC = Soil Plant Atmosphere Continuum relationship); the movement of water and the dissolved substances in it (including nutrients for plants) from the soil into plant tissues controlled, among others, by the atmosphere. As the consequences of such natural process to the plant life activities, they themselves must be able to adapt to these conditions, such as the opening and closing stomata, abortion, the formation of layers of anti-evaporation, etc. controlling atmospheric elements include the wind speed, relative humidity, solar lighting, air temperature. The water stress affects the plant growth and production. With the scarcity of water in this earth, which is suitable for human life and other living things, the study of the relationship between soil, water, plants and the atmosphere becomes essential.

Water Management for Agriculture (PNT 3225; 2/1)

This subject discuss the introduction to the functions and benefits of water management, the relation of soil and water to the plant growth; the nature of soil-water-plant relationship, water stress, available moisture, water movement, water required by plants (evaporation, transpiration, evapotranspiration, measurement, the use of water demand data for planning); water management for lowland rice (provision, measurement of discharge in channels), drainage, and irrigation laws.

Soil Pollution (PNT 4118; 2/0)

This subject discusses the definition and scope, and the importance of soil pollution problems, types of pollutants, sources of pollutants, effects of soil pollution on the environment and living matters, and buffering of the soil against pollution; the remediation of contaminated soil/land and environmental-friendly soil management.

Soil Survey, Evaluation and Use (PNT 3208; 2/1)

This subject discusses the definition, types, and the use of land surveys, land evaluation, and land use; land as natural resources; measurement and observation of parameters for determining land capability and suitability classes; assessment of land suitability and specific use purpose suitability; land use planning; the use/interpretation of aerial photo data, land maps, topographic maps, land use maps, and the use of Digitizing Information Systems.

Fertilization and Fertilizer Technology (PNT 4117; 2/0)

This subject studies the definition about fertilizer and fertilizing, the role of fertilizer in soil fertility and plant growth; their various types (organic, inorganic, biological), properties, manufacturing methods and their reactions in the soil; the basic ingredients of fertilizer, how to determine the dosage, how to use, and how to obtain efficient use of fertilizer.

Colloidal Chemical Physics (PNT 3214; 2/1)

This subject discusses:

- the processes of such as adsorption, desorption, isotherms, Freundlich, Gibbs, and Langmuir

equations,

- various forms of colloidal systems, such as soles, gels, emulsions, lyophils, liophobes, etc.
- Sol behavior such as Brownian motion, balance, electrical potential, diffuse double layer (*Diffuse Double Layer*).

Agricultural Climatology (PNT 4123; 2/1)

This subject explores the limits (definition) and scope, aspects of climate utilization, radiation distribution in plant societies, the use of radiation by plants, photo periodism, thermal radiation, air/leaf/soil temperature, how to overcome extreme temperatures, growing degree days, water and crop yields, season and crop yield forecasts, and suitability of climate for plants, and phenology.

Analysis of Soil, Water, Fertilizers and Plants (PNT 3202; 2/1)

This subject discuses about the position of soil, water, fertilizer, and plants analysis in the scope of soil science, the purpose of integrating the facts, biotic, and technology, the working of the analysis, examples of analysis of the four materials, such as pH, total nutrients, availability of the elements for plants, salinity, element fractionation, mineralogy, and micromorphology.

Handasah and Cartography (PNT 3206; 2/1)

This subject discusses about what cartography is and for, and learns about the elements in cartography, map depiction, topographic measurements, the basics of remote sensing systems, and geodetic activities in Indonesia.

Geomorphology and Landscape Analysis (PNT 3205; 2/1)

This subject studies the scope of geomorphology and landscape (landscape) analysis, rock structure and weathering processes, groundwater resources, river physiography, coastal plains and ocean waves. It also discuses the role of organisms in the formation of landscapes, low and high plains, hills, volcanic activities; as well the landscape analysis, aerial topographic and aerial map analysis, aerial photo specifications and effectiveness section, stereoscopic definition and mosaic arrangement.

Soil Management (PNT 4120; 2/1)

This subject examines the basics of land management, objectives, and benefits for humans and the environment. There are various ways of management, i.e. management of physical, chemical and biological soil. It also discuses the agricultural systems such as dry land agriculture, shifting cultivation, paddy systems, surjan systems, multi cropping systems, monoculture, aquaculture, etc. Information is also given about specific soil management for problematic soils, for example peat soils, acid sulphate soils, saline soils, sodic soils, acid mineral soils (red yellow podsolic = PMK), etc.

Digitization and Information Systems (PNT 4109; 2/1)

This subject discuss the benefits of and how to make maps, rapid visualization of information by applying computer systems, the internet, etc., the presentation of quantitative data by using the internet, computers, etc., so that information is easily distributed and accessed for all over the world using the system.

9. AGRICULTURAL MICROBIOLOGY STUDY PROGRAM

Microbiology Basics (PNM 2211; 2/1)

This subject introduces the various groups of microbes especially bacteria, yeast, mushrooms,

and actinomycetes, the history, importance, type of structure, and activity of microbial cells, such as nutrition, physiology, growth, and their interactions with the agricultural technology environment.

Introduction to Enzymology (PNM 2231; 2/0)

The discussion in this subject includes enzymes as proteins, biocatalysts, and their role in microbial life, as well as the kinetics, the action mechanism of catalysts, stability, influencing factors of enzyme activity, and application of enzymes in the fields of agriculture, food, feed and the environment.

Introduction to Microbial Taxonomy (PNM 3112; 2/1)

In this subject, students will have the understanding of the division of 3 groups (*kingdoms*) of living bodies (bacteria, archaea, and eukaryotes). The topics include the microbial metabolism, adaptation, and characteristics, either morphological, physiological or molecular, and the phylogenetic analysis methods.

Microbial Physiology (PNM 3132; 2/1)

Topics in this subject focus on the cell structure and organ function, nutrition and environmental factors, enzymes and regulation, bioenergy and metabolism, protein synthesis, microbial growth, genetic regulation information and gene expression.

Microbial Genetics (PNM 3121; 2/1)

This subject studies the genome system in prokaryotes and eukaryotes, genetical materials outside the chromosomes, genetical transfer systems changes in genetical material, basic techniques of DNA recombination, and genetical approaches to understanding cellular processes.

Microbial Ecology (PNM 3141; 2/1)

This subject discusses the relationship between environmental factors and microbial life, recognizes the associations between microbes - high-level bodies, and microbial interactions with their physical-chemical environment.

Soil Microbiology (PNM 3261; 2/1)

This subject provides knowledge about microbial populations in the soil, methods for studying them, their role in agricultural systems, soil fertility, nutrient cycling, and their interactions with plants and soil.

Aquatic Microbiology (PNM 3262; 2/1)

These subject outlines various types, activities, and roles of microbes in aquatic environments including rivers, lakes, underground water, and sea. Analysis of the role of microbes in the water, including: the utilization of biopsy in waste management, interaction of microbes with flora and fauna in the water, and the utilization of biological/microbial agents as indicators of water quality

Argo-Industry Microbiology (PNM 3251; 2/1)

This subject includes the general overview of the use of living bodies or parts thereof to produce goods or services. It discusses the description of existing microbial-based agricultural industry and regulations relating to biotechnology processes and products.

Field Work (PNM 3080; 0/2)

Field Work (KL) is a learning activity by performing the off campus working (Learning by doing) with the aim to develop insights, experiences and practical knowledge for the students. The activity is carried out by working in an institution or industry that requires labor in the field of microbiology

Seminar (PNM 4085; 0/1)

Seminar is an activity of delivering a literature study or research results in the form of scientific papers in an organized discussion. The topics written in the paper are within the scope/related fields of agricultural microbiology and must be delivered by students in the presence of students and lecturers

Thesis (PNM 4090; 4-6)

Thesis is a scientific paper compiled from the results of research carried out by the undergraduate students. The thesis preparation process includes the learning activity in planning, implementing, and reporting of the research results. The research topic chosen is within the scope of agriculture/microbiology.

Elective course in Study program within even semester

Biological safety (PNM 3252; 2/0)

This subject provided knowledge about safety management, hazard assessment, hazard prevention designs and tools, prevention techniques, accidents and first aid. It includes:

- the work procedures for "biological hazard", chemistry, and toxic substances,
- the procedures for receiving, storing, distributing and disposing of hazardous and toxic biological and chemical materials, potential impacts of harmful biological agents, chemic and toxic substances on the environment.
- The safety of untargeted organisms.
- The laws, regulations and ethics related to the development of biological agents.

Introduction to Enzyme Technology (PNM 3233; 2/0)

This subject discusses techniques for producing enzymes on a laboratory or industrial scale, isolation techniques, and formulations for their applications. Introduction to engineer the activity and enzyme resistance by using genetic engineering techniques is also given.

Biomass Production Technology (PNM 3234; 2/0)

This subject discusses the microbial propagation technology both on a laboratory and industrial scales as well the growth media, the nature of growth, the abiotic factors influencing the growth and how to control these factors.

Post-Harvest Microbiology (PNM 3253; 2/1)

This subject discusses the types of microbes and their yields, impacts, and how to handle them. It discusses the use of microbes for preserving and improving the crops quality.

Elective course in study program within odd semester

Soil and Environmental Biotechnology (PNM 4163; 2/0)

This subject discusses the use of soil microbes and their metabolic processes to increase plant productivity and improve the environment.

Introduction to Biodegradation and Bioremediation (PNM 4164; 2/0)

This subject discusses the biotransformation of xenobiotic compounds, microbial growth related to biodegradation, acclimation periods, enzymatic reactions, biodegradation mechanisms, detoxification and activation of xenobiotic compounds, concentration thresholds, factors playing the role in biodegradation, bioremediation mechanisms and technologies, bioaugmentation and bio-station, biosorption and their roles in the remediation of pollutants.

Microbial Biodiversity (PNM 4142; 2/0)

This subject discusses the definition, importance, criteria and the ways of determining the degree of biodiversity of diversity patterns, as well as the ways and management to maintain such diversity.

Thermo-microbiology (PNM 3234; 2/0)

This subject discusses the influence of temperature on microbes, the mechanism of microbial survival at extreme temperatures, and the use of extreme temperature resistant microbes, as well as the use of temperature to inhibit or eliminate microbes.