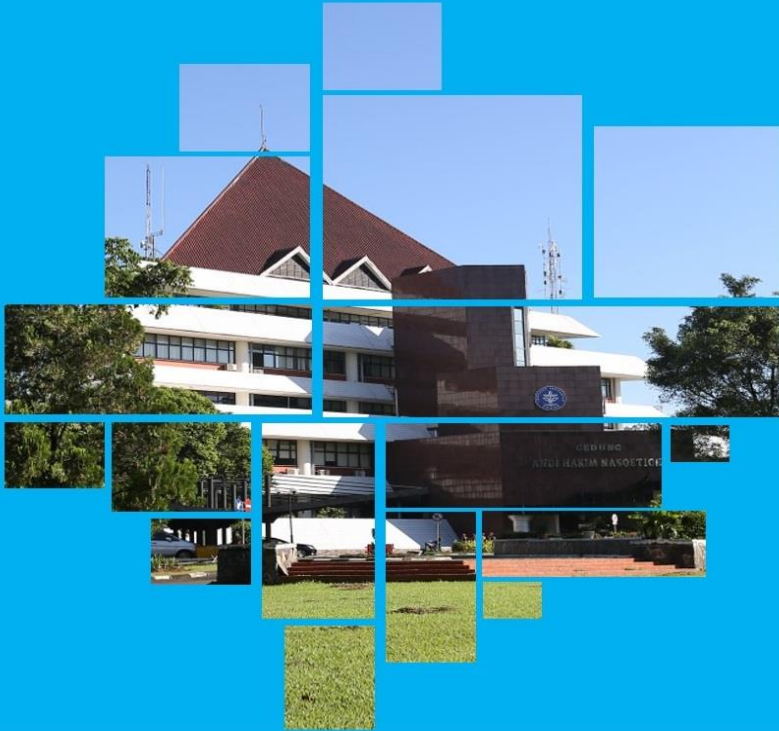




IPB University
— Bogor Indonesia —



General Competency Education Program

General Competency Education Program

The general competency education program (PPKU) is a subject that is held in semesters 1 and 2. It is implemented by the General Competency Education Program in collaboration with departments or faculties within IPB. The Types of PPKU subjects given to every student are customized with the necessities of each major.

No.	Subjects		Credits	Precondition	Semester	
	Code	Name			First	Second
Subject is organized by the Directorate of General Competency Education Programs						
1	IPB100-	Religion of Islam	3(2-2)		1	2
	IPB101	Religion of Protestan	3(2-2)		1	
	IPB102	Religion of Catholic	3(2-2)		1	
	IPB103	Religion of Hindu	3(2-2)		1	
	IPB104	Religion of Budha	3(2-2)		1	
	IPB110	Religion of Khonghucu	3(2-2)		1	
2	IPB111	Pancasila Education	2(1-2)		1	2
3	IPB106	Indonesian	2(1-2)		1	2
4	IPB107	Introduction to Agriculture	2(2-0)		1	
5	IPB108	English	3(2-2)		1	2
6	IPB112	Sport and Art	1(0-3)		1	2
7	MAT100	Introduction to mathematic	3(2-2)		1	
8	MAT101	Basic Mathematics	3(2-2)		1	2
9	MAT103	Calculus	3(2-2)			2
10	MAT113	Calculus IA	3(2-2)		1	
11	KIM100	General Chemistry	2(2-0)		1	2
12	KIM101	Chemistry	3(2-3)		1	2
13	KIM102	Basic Chemistry I	3(2-3)		1	
14	BIO100	Biology	3(2-3)		1	2
15	BIO101	General Biology	2(2-0)		1	
16	FIS100	Physics	3(2-3)		1	2
17	FIS103	General Physics	2(2-0)		1	
18	FIS101	Basic Physics I	3(2-3)		1	
19	EKO100	General Economics	3(2-2)		1	2
20	KPM130	General Sociology	3(2-2)		1	2
21	AGB100	Introduction to Entrepreneurship	1(1-0)		1	2
Subject taught by the Department or Faculty						
1	TSL120	Introduction to Soil Chemistry	3(2-3)	KIM101		2
2	TSL130	Introduction to Soil Physics	2(2-0)	FIS100		2

No.	Subjects		Credits	Precondition	Semester	
	Code	Name			First	Second
3	KPM210	Basic Communications	3(2-3)	KPM130		2
4	PTN201	Introduction to Agroecology	2(2-0)			2
5	PTN211	General Entomology	4(2-6)			2
6	ARL110	Drawing sketch	2(0-4)			2
7	ARL111	Introduction to Art and Architecture	3(2-3)			2
8	FKH30A	Veterinary Profession and Animal Welfare	2(2-0)			
9	AFF211	Anatomy of Veterinary I	3(2-3)	BIO100		2
10	BIK200	General Biochemistry	3(2-3)	KIM101		2
11	MSP111	Limnology	2(2-0)			2
12	FPK101	Introduction to fisheries and marine science	2(2-0)			2
13	FIS102	Basic Physics 2	3(2-3)			2
14	FPT101	Introduction to Husbandry	2(2-0)			2
15	PTP201	Base cattle production	3(3-2)	BIO100		2
16	NTP225	Nutrition Biochemistry	3(2-3)			2
18	MNH201	Introduction to Forestry and Environmental Ethics	2(2-0)			2
17	KSH210	Conservation of Natural Resources	2(2-0)			2
18	FTP200	Introduction to Agricultural Technology	2(2-0)			2
19	KIM220	Organic chemistry	3(2-3)			
20	TIN100	Introduction to Agroindustry	2(2-0)			2
21	KOM201	Computer Application	3(2-3)			2
22	GFM200	Introduction to Geoscience	3(3-0)			2
23	BIO130	Plant anatomy	3(2-3)			2
25	BIO210	Basic Microbiology	3(2-3)			2
26	KIM103	Basic Chemistry II	3(2-3)			2
27	MAT114	Calculus IB	3(2-2)	MAT113		2
28	MAT115	Introduction to Mathematical Logic	3(2-2)			2
29	KOM101	Algorithm	3(2-2)			2
30	MAN111	Introduction to Management	3(3-0)			2
31	AGB111	Basic Business	3(3-0)			2
32	EKS110	Arabic for Economics	3(2-3)			2
33	GIZ111	Human Anatomy	2(2-0)			2
34	GIZ112	Basic Nutrition	3(2-3)			2

No.	Subjects		Credits	Precondition	Semester	
	Code	Name			First	Second
35	IKK211	Introduction to family	3(3-0)			2
36	IKK121	Introduction to Psychology	3(3-0)			2
37	KPM100	Thinking and Scientific Writing	3(2-3)	IPB106, IPB108		2
38	KPM110	Basic Communicationss	3(3-2)	KPM130		2
39	SBI100	Business and Entrepreneurship	3(2-3)			2
40	SBI101	Personal Skill Development	3(2-2)			2

Course Description

1. MAT100 Introduction to Mathematics

3(2-2)

This course discusses the basic concepts of mathematics which includes mathematical logic concepts (the truth of a statement, argument, statement with quantification, mathematical induction), combinatorics (laws of multiplication, laws of addition, mutation, and combination), matrices, system linear equation, linear inequality, absolute value, function, model limit and continuity with more emphasized on the calculation aspect.

Ali Kusananto (Koord), Amril Aman, Bib. P. Silalahi, Budi Saharjo, Berlian Setiawaty, Donny C. Lesmana, Endar H. Nugrahani, Elis Khatizah, Fahren Bukhari, Farida Hanum, Hadi Sumarno, I Gusti Putu Purnaba, I Wayan Mangku, Jaharuddin, Tito Julito, Nur Aliatiningtyas, N.K. Kutha Ardana, Paian Sianturi, Prpto T. Supriyo, Ruhiyat, Retno Budiarti, Sugi Guritman, Sri Nurdianti, Siswandi, Toni Bakhtiar, Teduh Wulandari Mas'oed, Windiani Erliana, Hidayatul Mayyani.

2. MAT101 Basic Mathematics

3(2-2)

This course discusses the basic concepts of mathematics which include matrix algebra and its application (system of the linear equation), linear inequalities, absolute value, function, limit, continuity, derivative and its application to optimization problems, integral and its application to the problem of differential equations. In this course, the emphasis is more on the calculation aspect.

Ali Kusananto (Koord), Amril Aman, Bib. P. Silalahi, Budi Saharjo, Berlian Setiawaty, Donny C. Lesmana, Endar H. Nugrahani, Elis Khatizah, Fahren Bukhari, Farida Hanum, Hadi Sumarno, I Gusti Putu Purnaba, I Wayan Mangku, Jaharuddin, Tito Julito, Nur Aliatiningtyas, N.K. Kutha Ardana, Paian Sianturi, Prpto T. Supriyo, Ruhiyat, Retno Budiarti, Sugi Guritman, Sri Nurdianti, Siswandi, Toni Bakhtiar, Teduh Wulandari Mas'oed, Windiani Erliana, Hidayatul Mayyani

3. MAT103 Calculus **3(2-2)**

Precondition: MAT100

This course discusses derivatives of functions and their applications, function integrals, transcendent functions, integration techniques with the application of integrals, and introduction to differential equations with more emphasis on the calculation aspect.

Ali Kusnanto (Koord), Amril Aman, Bib. P. Silalahi, Budi Saharjo, Berlian Setiawaty, Donny C. Lesmana, Endar H. Nugrahani, Elis Khatizah, Fahren Bukhari, Farida Hanum, Hadi Sumarno, I Gusti Putu Purnaba, I Wayan Mangku, Jaharuddin, Tito Julito, Nur Aliatiningtyas, N.K. Kutha Ardana, Paian Sianturi, Prpto T. Supriyo, Ruhiyat, Retno Budiarti, Sugi Guritman, Sri Nurdianti, Siswandi, Toni Bakhtiar, Teduh Wulandari Mas'oe'd, Windiani Erliana, Hidayatul Mayyani

4. MAT113 Calculus IA **3(2-2)**

In this course following materials are discussed: Interval, inequality, and absolute value. Function and model. Limit and continuity. Function derivative and the application of function derivatives.

Ali Kusnanto (Koord), Elis Khatizah, Farida Hanum, Toni Bakhtiar, I Gusti Putu Purnaba

5. MAT114 Calculus IB **3(2-2)**

Precondition: MAT113

In this course following materials are discussed: Integral, the application of integral, transcendent function, and integration techniques.

N.K. Kutha Ardana (Koord), Ruhiyat, Ali Kusnanto, Farida Hanum, Jaharuddi, I Wayan Mangku, Bib P. Silalahi.

6. KIM100 General Chemistry **2(2-0)**

This course discusses chemistry elements and how to understand chemical language. The atomic nucleus and its practical meaning for welfare. Interaction between intramolecular and macroscopic consequences of water molecules. Acid-base and reactions, reduction-oxidation. Organic compounds in a flash. Chemicals in our bodies, nutrition, and how it works. Chemical drug and mechanism of action in the body. Optimizing food production from the earth. Freshwater resources, roles, and human responsibilities. Air resources on our planet. Material resources in our society. Energy resources currently and future.

Chemistry Departement Teaching Team

7. KIM101 Chemistry

3(2-3)

This course is given to provide knowledge about concepts of basic chemistry are delivered simply and popularly, involves an introduction to the definition and importance of chemistry; the definition of the atom and atomic structures; nucleus chemistry; chemical bond; names, formulas, and chemical equations; acid or base; reduction and oxidation; organic chemistry and polymer; energy; chemical environment; agricultural chemistry; food chemistry; chemotherapy and chemical toxicology.

Chemistry Departement Teaching Team

8. KIM101 Basic Chemistry I

3(2-3)

This course discusses the basic concepts as a strong base requires basic chemistry including the definition of subject materials and measurements, structures and atomic characteristics, a chemical bond, stoichiometry, form substance, energy relations in chemical reactions, and physical characteristics of the solution.

Chemistry Departement Teaching Team

9. BIO100 Basic Biology

3(2-3)

This course explains theory and basic biology principles which can be base for students to understand the major they will take based on the field of science (non-social economy). This course is completed with practicum as supporting theoretical knowledge which is given in lectures. The study started by explaining the biology scope and origin of life. Furthermore, It is until the mid-term test, the study explains the structure and biological function at the cell level, genetic, and applications in biotechnology. In the next section, it is until the final test, the study explains biodiversity and bio function in the organism, population, community, ecosystem. The study ends with a conservation biology discussion. For helping students to understand the principle and basic theory, giving examples for each topic.

Biology Departement Teaching Team

10. BIO101 General Biology

2(2-0)

This course is given in the General Competency Education Program (PPKU) IPB. This course provides knowledge, development insight, and biology benefits currently. The study in the course explaining basic concepts from biology themes and application examples from the themes in daily life. Biology themes studied in weeks 1-7 about cell (lysosomal disorders, sperm motility) transport through cell membrane including Exo and endocytosis, cellular respiration (effects of toxic compounds on respiration, fermentation),

photosynthesis (benefit, urban farming, city park, green line, global warming) genetic material and mutation (cancer, hereditary disease) genetic engineering (GMO, Genom project, cloning, stem cells, biotech in industry). Furthermore, the study in weeks 8-14 covering diversity and organism role; monera and protists(disease-causing bacteria, biological weapon, bioremediation, disease-causing protozoa, algae for industry), fungus (advantageous and disadvantageous), plant (diversity and roles), animal (diversity and roles) and ecology (environmental problem, climate, pollutant, human population, invasive species case)

Biology Departement Teaching Team

11. FIS100 Physics

3(2-3)

This basic physics course is given for majors who need a strong base physics. So that, it is a bridge to various courses higher level.

The material given is mechanics and thermodynamics with consideration, the part is most needed for majors. Analytical tools needed in this course are differential calculus and simple integral already introduced at the senior high school level.

Physics Departement Teaching Team

12. FIS103 General Physics

2(2-0)

General physics course is given for majors based on science but it does not require a strong physics base.

This course material includes mechanics, waves, thermodynamics, magnetism, and modern physics. Analysis tools are used ordinary arithmetic (plus, minus, multiple, divide, squared, square root)

Physics Departement Teaching Team

13. IPB106 Indonesian

2(1-2)

This course is given for students, so that the students can use Indonesian correctly. This course is designed and arranged for students used to appreciate. Using Indonesian correctly and properly. The topics discussed: EYD; sentence structure; effective and logical sentence; paragraph; types of writing; correspondance and scientific work.

Endang Sri Wahyuni (Koord), Defina, Krishandini, Henny Krishnawati, Yenny Apriliani, Laksmi Arianti, Budiyo, Triyono, Lanti Mustika, Heru Pratikno, Langgeng Prima Anggradinata, Dhea Ayuningsih, Risa Prayudi

14. IPB108 English

3(2-2)

This course describes techniques and strategies to understand an English discourse reading text and sentence structure related to reading material or English discourse.

Tatie Sadewo (Koord), Alfa Chasanah, Nilawati, Irma Rasita Gloria Barus, Muhammad Thonthowi Djauhari, Gatot Widodo, Ahmad Ridha, Amita Nucefera Nida Silma, Hesti Sulistyowai, Raden Adjeng Sri Sugyaningsih, Gifta Firdiana, Harries Marithasari, Lukman Gandarmaya, Rizdika Mardiana, Yose Eduar Muda, Reny Astiyarini Umas, Widharto

15. IPB112 Sport and Art

1(0-3)

Learning sport and art is an effort by lecturers and students can actualize all the potential of their activities as humans in the form of attitudes, actions, and works that are given form, content, and direction for personal roundness appropriate goal humanity. Through sports activities, students are expected to grow and develop healthily, fresh physically and also they can grow personality to be more harmonious. Students can give a contribute, especially through the experiences of motion. Overall, they can grow and develop physical, spiritual, social, emotional, intellectual, moral as well as spiritual elements.

Sitti Sugiah

16. IPB100 Islamic Education

3(2-2)

Studying and giving a comprehension about human nature that need a life guide both individually and socially, to achieve world and afterlife happiness. By understanding ourselves and the universe that has been given a rule by the creator, those rules are called kauniyah and tanziliyah. This tanziliyah verse is detailed in the discussion of aqidah, syari'ah, morality, and Islamic history. The main emphasis is on the application of teachings in daily behavior, whether sourced from the Qur'an as well as from the sunnah of the Prophet Muhammad S.A.W.

Irzaman (Koord), Asep Nurhalim, Hasim, Achmad, Neneng Hasanah, Abdul Munif, Furqon Syarief Hidayatullah, Musthofa, Laily Dwi Arsyianti, Didin Hafidhudin Maturidi, E. Syamsuddin, Wachind Romadlon, A. Syahirul Alim, Ahmad Soleh

17. IPB101 Religion of Protestan

3(2-2)

Develop the basic application of the Christian faith to complete students, so that students can grow as perfect personalities and a new creation in Jesus Kristus. Increasing responsibility towards Allah through sensitivity to others and their environments. Therefore, an academic person can participate in society with dedication based on service for honor and the Glory of Allah.

Elisa Ganda Togu Manurung (Koord), Djuara P. Lubis, Rilus, Charles P Haratua
Simanjuntak, Suharno, Bintang Ch. Simangunsong, Jonson L. Gaol

18. IPB102 Religion of Catholic

3(2-2)

An increased understanding of the concept of faith in a church, church life, community in developing attitudes and personal mentality of Catholic bachelors who can dedicate to Indonesian people as an expression of their faith.

Yohanes Driyanto

19. IPB103 Religion of Hindu

3(2-2)

This course aims to improve comprehension, appreciation, and Hinduism experiences, strengthen faith and belief, also improving devotion to Ida Sang Hyang Widhi Wasa (The One Almighty God). So that, it can be self-control in thinking, talking, and doing in homeland, nation, and country dedication, to support national development and achieving the goals of human life. To achieve the above goals, then this study discussed the following materials: Hindu history, Vedas, basics of Hinduism, techniques to achieve the religious goal, Hindu philosophy, Hindu etiquette, Yadnya, Hindu society, and basics of Hindu leadership.

I Wayan Mangku

20. IPB104 Religion of Budha

3(2-2)

Studying the main teachings of Buddhism, application in a science field, technology, and the experience properly in daily life, nation, and state.

Hermawan Wana

21. IPB110 Religion of Khonghucu

3(2-2)

The purpose of this Khonghucu education is students get the correct information about Khonghucu, understanding, comprehending and taking the essence of Khonghucu teaching universal so that students be able to practice expectedly in daily life, to become Kuncu (Virtuous), having noble character and high moral based on love, truth, immoral, wise and can be trusted which in the end becomes a good society and can build nation and also state of Indonesia.

J.S. Gunadi

22. IPB111 Pancasila Education

2(1-2)

Understanding Pancasila as the basic value of the state, the constitutional system of the Republic of Indonesia with historical studies, philosophical juridical, ideology, and understanding of Pancasila as actualization paradigm in social life, nation, state. Understanding about nation, state, right and civic duties, defend the country, democratization, archipelago insight, human right, regional autonomy, environment, national security, and national strategy politics.

Didid Diapari (Koord), Siti Rahmawati, Indah Wijayanti, Fana Dewi Savitri, Sri Rahayu, Ujang Sehabudin, Gunter, Sedarnawati Yasni, Sri Rachjati Eidman, Parlaungan Rangkuti

23. EKO100 General Economics

3(2-2)

This course provides a general economic overview, economic agents, demand, supply, budget line, indifference curve, production, cost, market structure, macroeconomic key variable, national income, change in national income, fiscal policy, and monetary policy.

24. KPM130 General Sociology

3(2-2)

This course explains sociology as knowledge, society, and culture, social institution, social group, social organization, social stratification and power system, social process in society, social change, and development.

SKPM Departement Teaching Team

25. IPB107 Introduction to Agriculture

3(2-2)

This course is designed and arranged for ushering IPB students to the agriculture world in a broad sense by discussing various topics related to agriculture starting with Scientist and Science, Agricultural Science and Environment, Agricultural History, Business Farming, Weather and Climate, the elements, Indonesian Climate, Energy and Photosynthesis, Food and Nutrition, Life cycle, Post Harvest Technology, non-Food Agricultural, Agribusiness and Agroindustry, Biotechnology and Hydroponics, 21st Century Agricultural vision.

Utomo Kartosuwondo (Koord), Sudirman Yahya, Hidayat Pawitan, Eduard Halomoan Siregar, Didy Sopandie, Endang Sri Ratna, Lala M. Kolopaking, Purwono, Burhanuddin Masyud, Ma'mun Sarma, Muhammad Zairin Junior, Ervival Amzu, Hardinsyah, Lisdar A.

Manaf, Hadi Susilo Arifin, Ligaya I.T.A. Tumbelaka, Kukuh Murtalaksono, Cecep Kusmana, Slamet Budijanto, Hartrisari H, I Komang Gede Wiryawan, Dewi Apri Astuti, Trikoesoemaningtyas, Suria Darma Tarigan, Koekoeh Santoso, Ahmad Sulaeman, Surachmai Setiyaningsih, Syaeful Anwar, Evy Damayantheni, Budi Setiawan, Imam Wahyudi, Sulistono, Muhammad Fedi Alfiadi Sondita, Wawan Hermawan, Tania Tune, Sugeng Santoso, Erizal, Ibnul Qayim, Bambang Dwi Dasanto, Iskandar Zulkarnaen Siregar, Noor Farikhah Haneda, M. Faiz Syaib, Feri Kusnandar, Eko Sri Wiyono, Edi Santoso, Desta Wirnas, Lina Karlinasari, Epi Taufik, Ania P. Widhaiani, Kaswanto, I Putu Santikayasa, Muh Taufik, Ismail Pulungan.

26. AGB100 Introduction to Entrepreneurship

1(1-0)

This course provides knowledge, skill, and the importance of entrepreneurship, how to build a dream, entrepreneurial motivation development, entrepreneurial characteristics, invention, and entrepreneurial idea development also experience from the business practitioner.

Burhanuddin, Teaching Team

Department of Aquatic Resources Management

Courses : **Aquatic Resources Management**

- Learning Outcomes** :
1. Able to apply planning techniques and approaches to the management of aquatic resources, fisheries and the environment as well as conservation of aquatic resources through the process of identification, analysis, calculation, and interpretation of the typology of aquatic ecosystems and their components in optimal, participatory, and sustainable manners in certain aquatic ecosystems.
 - 1.1 Identifying and analysing aquatic biota.
 - 1.2 Measuring water quality and pollution levels, as well as analysing the ecotoxicological response of aquatic biota to environmental changes.
 - 1.3 Analyse the biological, physiological, and ecological characteristics of aquatic biological resources.
 - 1.4 Analysing the hydrodynamics of waters.
 - 1.5 Manage water quality, environmental health, and aquatic resources.
 - 1.6 Calculating the productivity of waters (primary and secondary).
 - 1.7 Managing conservation area and aquatic ecotourism.
 - 1.8 Develop spatial and temporal-based information systems for waters, fisheries, and aquatic resources.
 - 1.9 Predicting fish stocks.
 - 1.10 Determining the impact of human activities on components of the aquatic environment
 - 1.11 Calculating the carrying capacity of waters, fisheries, and regions.
 - 1.12 Develop a fisheries management plan (RPP).
 - 1.13 Managing sustainable fisheries resources.
 - 1.14 Managing the aquatic environment, fisheries, and carrying capacity-based areas.
 - 1.15 Conservation of aquatic biological resources
 2. Mastering the principles of science and management of aquatic resources, fisheries, and the environment as well as conservation of aquatic resources based on the health of the aquatic environment, the dynamics and typology of aquatic resources, and the dynamics of fisheries resources so as to be able to apply and communicate the management of aquatic resources, fisheries and the environment as well as the conservation of aquatic resources.
 - 2.1 Mastering the principles of dynamics and typology of aquatic resources
 - 2.2 Mastering the principles of fisheries resource dynamics
 - 2.3 Mastering the principles of aquatic environmental health sciences
 - 2.4 Communicating the principles of the science of biological resource conservation and aquatic ecotourism
 - 2.5 Understanding policies, laws and regulations related to the management of aquatic resources, fisheries, and the environment as well as the conservation of aquatic resources
 3. Able to make decisions in choosing alternatives to water resource management, fisheries and the environment as well as conservation of aquatic resources academically and independently and can work in small groups with guidance.
 4. Have adaptive, inclusive, communicative, aesthetic and ethical traits.

Curriculum Structure

No.	Courses		credits	Prerequisite	Semester	
	Code	Name			Odd	Even
General Competency Education Courses						
1	IPB100-104-110	Religion	3(2-2)		1	
2	IPB106	Indonesian	2(1-2)		1	

No.	Courses		credits	Prerequisite	Semester	
	Code	Name			Odd	Even
3	IPB107	Introduction to Agricultural Sciences	2(2-0)		1	
4	MAT101	Foundations of Mathematics	3(2-2)		1	
5	KIM101	Chemistry	3(2-3)		1	
6	BIO100	Biology	3(2-3)		1	
7	EKO100	General Economy	3(2-2)		1	
8	IPB111	Pancasila Education	2(1-2)			2
9	IPB108	English	3(2-2)			2
10	IPB112	Sports and Arts	1(0-3)			2
11	FIS100	Physics	3(2-3)			2
12	KPM130	General Sociology	3(2-2)			2
13	AGB100	Introduction to Entrepreneurship	1(1-0)			2
Sub Total credits			31			
Interdepartmental Course						
1	FPK101	Introduction to Fisheries and Marine Science	2(2-0)			2
2	ITK221	General Oceanography	3(2-3)		3	
3	STK211	Statistical Methods	3(2-3)			4
4	THP200	Fundamentals of Aquatic Product Technology	3(2-3)			4
5	PSP212	Fishing Methods	3(2-3)		3	
6	BDP200	Basics of Aquaculture	3(2-3)		3	
7	KPM210	Basics of Communication	3(2-3)		5	
Sub Total credits			20			
Major Courses						
1	MSP111	Limnology	2(2-0)			2
2	MSP222	Aquatic invertebrates	3(2-3)			2
3	MSP221	Aquatic Ecology	3(2-3)		3	
4	MSP223	Ichtiology	3(2-3)		3	
5	MSP232	Fisheries Resources	2(2-0)		3	
6	MSP212	Water Quality	2(1-3)	KIM101	3	
7	MSP233	Aquatic Resources Information System	3(2-3)		3	
8	MSP225	Functional Ichtiology	3(2-3)	MSP 223		4
9	MSP226	Physiology of Aquatic Animals	3(2-3)	MSP 223		4
10	MSP227	Ecology of Coastal Waters and Tropical Seas	3(2-2)	MSP221		4
11	MSP231	Fisheries Biology	3(2-3)			4
12	MSP301	Scientific Research and Writing Methods	2(1-3)		5	
13	MSP310	Aquatic Pollution and Bioindicators	3(2-3)		5	
14	MSP311	Planktonology	3(2-3)		5	
15	MSP315	Hydrodynamics of the Aquatic Environment	2(2-0)		5	
16	MSP316	Aquatic Plant Science and Macroalgae	2(1-3)		5	
17	MSP324	Aquatic Social Ecological System	2(2-0)	MSP227	7	
18	MSP336	Fish Population Biology	3(2-3)	MSP231		4
19	MSP338	Basic-Dasar Fish Population Dynamics	3(2-3)		5	
20	MSP31A	Aquatic Environment Productivity	3(2-3)	MSP212		6
21	MSP318	Wastewater Treatment Technology	2(1-3)	MSP212		6
22	MSP322	Conservation of Aquatic Biological Resources	3(2-2)			6
23	MSP326	Aquatic Mammalogy and Herpetology	2(2-0)			6

No.	Courses		credits	Prerequisite	Semester	
	Code	Name			Odd	Even
24	MSP323	Aquatic Ecotoxicology	3(2-3)			6
25	MSP333	Basics Fish Stock Assessment	3(2-3)	MSP338		6
26	MSP339	Quantitative Methods of Aquatic Resources and Fisheries	3(2-3)			6
27	MSP319	Aquatic Environmental impact assessment	2(2-0)		7	
28	MSP413	Aquatic Resources Policy	2(2-0)		7	
29	MSP414	Aquatic Resources Management	3(2-2)	MSP31A	7	
30	MSP415	Integrated Coastal Area Management	2(2-0)		7	
31	MSP422	Aquatic Ecotourism	2(2-0)		7	
32	MSP432	Fisheries Resource Management	3(2-2)		7	
33	FPK401	Thematic Field Work	3	Passed MK PPKU, FPK 101, at least 81 credits of MK major		6
34	MSP402	Seminar	1			7/8
35	MSP403	Final Project (Thesis)	6			8
	Sub Total credits		93			

Course Description

1. MSP111 Limnology 2(2-0)

Study of the typology and characteristics of fresh waters both flowing (lotic, from upstream to estuary (downstream / estuary) and flooded (lentic, natural and artificial); includes aspects of Paleolimnology, physical aspects (morphometry, light, and temperature), chemical aspects, and biological aspects; utilisation and efforts to manage it.

Majarina Krisanti (Coordinator), Niken Tunjung Murti

2. MSP221 Aquatic Chronology 3(2-3)

This COURSE discusses ecological processes in the aquatic environment, such as energy flow, material cycle, water limiting factors; organisational structure of aquatic organisms (populations and communities); aquatic ecosystems which include fresh, estuary and marine, changes and succession of ecosystems, pollution and biodiversity.

M.F. Rahardjo (Coordinator), Djamar Lumban Batu

3. MSP222 Aquatic Invertebrate 3(2-3)

This course discusses the structure and role of aquatic invertebrate animals in fisheries resources. The function of organs in the reproduction and growth of aquatic invertebrates.

Djamar Lumban Batu

4. MSP223 Ichtiology 3(2-3)

This course discusses the identification, classification, and description of fish, geographical and ecological distribution of fish, fish anatomy, Chondrichthyes and Osteichthyes Classes, and fish diversity.

Sulistiono (Coordinator), Ridwan Affandi, M.F. Rahardjo, M. Mukhlis Kamal, Charles P.H. Simanjuntak

5. MSP232 Fisheries resources 2(2-0)

After completing this course, students are able to explain the characteristics of types/groups of fishery resource commodities that are of economic value from various habitats and that have the potential to be developed as well as alternative development for various purposes and support sustainable utilization management.

Zairion (Coordinator), Yonvitner, Ali Mashar

6. MSP212 Water Quality 2(1-3)

Prerequisite: KIM101

Understanding of water quality, characteristic key parameters in assessing the feasibility of water quality as habitats and resources. Understanding of physical parameters (brightness, temperature, solids, turbidity), chemical parameters (dissolved gases, pH, alkalinity, nutrients, organic, inorganic), and biological (microbial) parameters, as well as practical abilities in water quality analysis.

Sigid Hariyadi (Coordinator), Inna Puspa Ayu, Hefni Effendi

7. MSP225 Functional Ichtiology 3(2-3)

Prerequisite: MSP223

This course discusses the 10 organ systems of the fish body through macro-study of internal anatomy and its function in relation to fish adaptation to the environment.

M. Mukhlis Kamal (Coordinator), Charles P.H. Simanjutak

8. MSP226 Physiology of Aquatic Animals 3(2-3)

Prerequisite: MSP223

This course explains the concept of physiology in aquatic animals; cell physiology and metabolism, the concept of homeostatic and bioenergetics of circulatory processes, respiration, digestion, osmoregulation, reproduction and the possibilities to make manipulations in these processes to increase production, increase catches, successful management and stimulate the reproduction of aquatic animals.

Ridwan Affandi (Coordinator), Etty Riani, M. Mukhlis Kamal

9. MSP227 Ecology of Coastal Waters and Tropical Seas 3(2-2)

Prerequisite: MSP221

This course explains the ecological dynamics of coastal and marine waters, especially in coastal waters and tropical seas, and their dynamics with a focus on tropical coastal ecosystems, based on processes and principles of Physico-chemical/physiological dynamics related to the dynamics of biological-ecological systems of coastal areas and tropical seas, as the basis in the environmental management of coastal waters and tropical seas.

Ario Damar (Coordinator), Fredinan Yulianda, Augustine M. Samosir, M. Mukhlis Kamal

10. MSP 231 Fisheries Biology 3(2-3)

Fisheries biology is the study of fish as a resource that can be harvested by humans (economic / non-economic). Fisheries biology studies the life cycle of fish, from birth to death which includes: (a) fecundity and reproduction patterns, age at the time of reaching gonadal maturity and sex ratio, speed of survival and mortality at the stages of the life cycle (b) ecological distribution, movement and harmony, fish behavior in 24 hours or from season to season, (c) intra- and inter-species interactions, how special interactions in their living environment will affect other populations/species, (d) populations and the factors that control them, the speed of growth and time to reach the average size of various fish, and (e) the influence of captivity on population, reproduction and growth.

Yonvitner (Coordinator), Zairion, Ali Mashar

11. MSP233 Aquatic Resources Information System 3(2-3)

Basics of algorithms and programming, databases, model applications and simulations of aquatic ecosystems, Aquatic Resources Management information systems and geographic information systems.

12. MSP301 Scientific Research and Writing Methods 2 (1-3)

Understanding the philosophy of science and technology; explanation of the essence and process of research; the mindset of scientific research; research topics and issues (scope according to competence according to Sections in the Department); framework of thought and research hypotheses, methods of data collection, processing, presentation of scientific information and writing methods for the preparation of scientific works.

Niken T.M. Pratiwi (Coordinator), Rahmat Kurnia

13. MSP310 Aquatic Pollution and Bioindicators 3(2-3)

Understanding pollution in freshwaters and the sea by studying the source and characteristics of pollutants, the processes experienced by pollutants in the waters, the impact on aquatic ecosystems including the use of bioindicators, as well as the basic concepts of estimating pollutants.

Yusli Wardiatno (Coordinator), Sigid Heriyadi, Aliati Iswantari

14. MSP311 Planktonology 3(2-3)

This course contains the terminology and classification of plankton and aquatic primary producers and discusses its behavior, role, and ecological relationships in aquatic ecosystems, as well as its benefits to humans; several Environmental Index formulas were introduced to train the skills of assessing the condition of a body of water.

Niken T.M. Pratiwi (Coordinator), Majorina Krisanti

15 MSP315 Hydrodynamics of the Aquatic Environment 2(2-0)

The course provides the students with knowledge of mass and energy transportation that is influenced by waves, tides, *internal waves*, *up-welling*, current, turbulence, and water circulation that occurs in the sea, estuary, lake and hydrodynamics of rivers. Various components of the earth's climate system. A review of El Niño, seasonal climactic anomalies, natural and anthropogenic climate change and its influence and impact on the hydrodynamics of the aquatic environment.

Sigid Hariyadi (Coordinator), Yusli Wardiatno

16 MSP316 Aquatic Plant Science and Macroalgae 2(1-3)

The COURSE provides the students with the understanding of the definition, scope, role, function, and benefits of aquatic plants and macroalgae in various aquatic typologies, as well as their economic and ecological application, especially in overcoming 'climate change'.

Niken T.M. Pratiwi (Coordinator), Inna Puspa Ayu, Majorina Krisanti

17. MSP324 Aquatic Social Ecological System 2(2-0)
Prerequisite: MSP227

This course discusses the concepts of ecosystem-based marine and coastal management where all interactions in the ecosystem are taken into account; marine planning in ecosystem-based management (establishment of marine management units, cost-effective analysis in marine management, marine and coastal stewardship); accumulative impacts; carrying capacity, as well as monitoring and evaluation in marine and coastal management.

Augustine M. Samosir

18. MSP336 Fish Population Biology 3(2-3)
Prerequisite : MSP231

The course discusses the principles of population dynamics and population genetics, and integrates the two disciplines to identify the status of aquatic biota populations up to the sub-population level for the purpose of managing the sustainability of fisheries resources. The principles of population dynamics discussed include age structure and unexploited population growth. The principles of genetics discussed include genetic analysis of a population or subpopulation based on molecular and isozyme.

Nurlisa A. Butet (Coordinator), Menoofatria Boer, Ali Mashar

19. MSP338 Basics of Fish Population Dynamics 3(2-3)

This course discusses the changes that occur in a fish population which include growth, mortality, recruitment, and reproduction. In addition, various methods for estimating fish abundance are also included.

Mennofatria Boer (Coord), Grace of Kurnia

20. MSP31A Aquatic Environment Productivity 3(2-3)
Prerequisite: MSP212

Primary and secondary productivity in a variety of different ecosystems (stagnant, flowing waters) the way of measurement and its constituent components; role as an estimator of fertility.

Yusli Wardiatno (Coordinator), Niken T.M. Pertiwi, Aliati Iswantari

21. MSP318 Wastewater Treatment Technology 2(1-3)
Prerequisite: MSP212

This course provides an explanation of the basics of wastewater treatment, the sources and causes of wastewater treatment as well as the planning and implementation of wastewater treatment, both physically, chemically and biologically.

Hefni Effendi (Coordinator), Majorina Krisanti, Yusli Wardiatno, Zulhamsyah Imran

22. MSP322 Conservation of Aquatic Biological Resources 3(2-2)

This course explains the understanding of the conception of resource conservation, biodiversity, criteria, functions and utilization of conservation areas and the management of biological resources of public, coastal and marine waters, related to sustainable development through protection and preservation.

Fredinan Yulianda (Coordinator), Augustine M. Samosir, Achmad Fahrudin, M.F. Rahardjo

23. MSP326 Aquatic Mammalogy and Herpetology 2(2-0)

This course discusses aspects of the biology and ecology of mammals, reptiles, and amphibians including morphology, distribution, reproduction, and migration; the extent of the shock to extinction, and conservation efforts.

M. Mukhlis Kamal (Coordinator), M.F. Rahardjo, Djamar Lumban Batu

24. MSP323 Aquatic Ecotoxicology 3(2-3)

Aquatic Ecotoxicology provides an understanding of the source, properties and influence of toxic materials on aquatic biota through approaches to absorption, distribution, excretion, biotransformation, metabolism as well as chemical and physical transformations.

Djamar Lumban Batu

25. MSP333. Basics of Fish Stock Assessment 3(2-3)

Prerequisite : MSP338

Fish stock assessment discusses stock assessment techniques both analytically / structurally, globally and combined (holistically). The discussion was carried out through simple models and more complex models such as surplus yield models and catch forecasting as well as dynamic pool models needed in sustainable fisheries resource management.

Mennofatria Boer (Coord), Luky Adrianto, Grace Kurnia

26. MSP339 Quantitative Methods of Aquatic Resources and Fisheries 3(2-3)

This course explains quantitative methods for water resource data processing starting from the method of drawing data samples, experimental design, survey methods, multiple regression, and multivariate introduction.

Rahmat Kurnia (Coord), Mennofatria Boer, Achmaf Fahrudin

27. MSP319 Aquatic Environmental impact assessment 2(2-0)

Review of various development activities and their impact on aquatic ecosystems and determine important impact criteria and management efforts.

Hefni Effendi (coordinator), Gatot Yulianto, Zulhamsyah Imran

28. MSP413 Aquatic Resources Policy 2(2-0)

This course explains the definition of aquatic resources as public goods and their consequences, national and international regulations and policies on water resource management that have been established by the Government of Indonesia and International Institutions. Furthermore, it will be discussed regarding the facts of policy issues, problems in managing aquatic resources, government failures, and market failures that cause policy interventions to be needed. At the end of this lecture, policy analysis in the manufacturing process is presented as well as some concepts of resource policy and institutional management of aquatic resources needed to achieve sustainable management.

Gatot Yulianto (coordinator), Taryono

29. MSP414 Aquatic Resources Management 3(2-2)

Prerequisite : MSP31A

The COURSE teaches the students to be able to understand the planning of optimal and sustainable utilization of aquatic resources for the welfare of the community. Understand the principles of Aquatic Resources Management, including understanding the scope, typology, evaluation of potential status and institutional aspects.

Sigid Hariyadi (coordinator), Niken T.M. Pratiwi, Taryono, Aliati Iswantari

30. MSP415 Integrated Coastal Area Management 2(2-0)

This course explains the potential and development of coastal areas, the concept of integrated and sustainable coastal environmental management, the characteristics of coastal ecosystems, coastal dynamics, the principles of coastal area spatial planning through a chemical biophysical approach and socioeconomic and cultural characteristics.

Bambang Widigdo (coordinator), Zulhamsyah Imran

31. MSP422 Aquatic Ecotourism 2(2-0)

Characteristics of aquatic resources for the development of ecotourism, as well as classification, and principles of sustainable aquatic ecotourism management.

Fredinan Yulianda (coordinator), Augustine M. Samosir

32. MSP432 Fisheries Resource Management 3(2-3)

After completing this course, students are able to understand the fisheries system consisting of fish and habitat resource sub-systems, fisheries actors sub-systems and fisheries management and policy sub-systems, know the characteristics of fisheries uncertainty, know the components of fisheries management, *typology of fisheries management measures* and know the stages of fisheries planning.

Mennofatria Boer (coordinator), Luky Adrianto

33. FPK401 Thematic Field Work 3

Prerequisites: Pass the PKUcourse, FPK101, at least 81 credits of major courses

This course provides lessons for students to apply and develop the knowledge that has been learned for the progress of fisheries communities and learn to overcome problems that arise in the field (villages that have fishery business activities or coastal villages in Indonesia that are priorities). These activities include debriefing lectures, implementation of activities, evaluation of implementation, and preparation of reports.

Niken T.M. Pratiwi (coordinator), Taryono, Gatot Yulianto, Augustine M. Samosir, Aliati Iswantari

34. MSP402 Seminar 1

Submission of research results by final year students, before conducting a thesis exam.

MSP Department Teaching Team

35. MSP403 Thesis 6

Problem review in the form of research, in the science of Aquatic Resources Management, which includes problem formulation, presentation of results and discussion, as well as drawing conclusions according to scientific principles. This activity includes planning or making proposals, implementing activities, and preparing a thesis, as well as a thesis exam. This activity can be done after students have collected 105 credits.

MSP Department Teaching Team

Department of Aquatic Product Technology

- Courses** : **Aquatic Product Technology**
- Learning Outcomes** :
1. Mastering the principles of fisheries and marine science
 2. Able to characterize the physicochemical properties of aquatic resources
 3. Mastering the science and technology of processing aquatic products and being able to apply it to the fishing industry
 4. Mastering the principles of product development and being able to design and formulate aquatic products
 5. Mastering the field of biotechnology and bioprospecting of aquatic products for food and non-food development
 6. Mastering knowledge of standardization systems and being able to design food safety management systems.
 7. Able to develop themselves, responsibility, self-confidence, work in a team and independently, have the ability to communicate effectively in writing and orally and have a strong desire to develop science and technology.

Curriculum Structure

No.	Courses		credits	Prerequisite	Semester	
	Code	Name			Odd	Even
General Competency Education Courses						
1	IPB100	Religion	3(2-2)		1	
2	IPB 110	Pancasila Education	2(1-2)			2
3	IPB106	Indonesian	2(1-2)		1	
4	IPB107	Introduction to Agricultural Science	2(2-0)		1	
5	IPB 108	English	3(2-2)			2
6	IPB112	Art and Sport	1(0-3)			2
7	MAT101	Foundations of Mathematics	3(2-2)		1	
8	KIM101	Chemistry	3(2-3)		1	
9	BIO100	Biology	3(2-3)		1	
10	FIS 100	Physics	3(2-3)			2
11	EKO100	General Economy	3(2-2)		1	
12	KPM130	General Sociology	3(2-2)			2
13	AGB100	Introduction to Entrepreneurship	1(1-0)			2
Sub Total credits			32			
Interdepment Course						
1	MSP223	Ichtiology	3(2-3)		3	
2	FPK101	Introduction to Fisheries and Marine Science	2(2-0)			2
3	BIO210	Basic Microbiology	3(2-3)		3	
4	BIK200	General Biochemistry	3(2-3)		3	
5	STK211	Statistical Methods	3(2-2)			4
6	ITK 221	Oceanography Umum	3(2-3)		3	
7	MSP221	Aquatic Ecology	3(2-3)		3	
8	BDP200	Basics of Aquaculture	3(2-3)		3	
9	PSP 212	Fishing Methods	3(3-0)		3	
Sub Total credits			26			
Major Courses						
1	THP200	Fundamentals of Aquatic Product Technology	3(2-3)			4
2	THP201	Methods of Scientific Work	3(2-3)			4
3	THP211	Introduction of Raw Materials for aquatic products industry	3(2-3)			4
4	THP212	Physiology, Formation and Degradation of Aquatic Metabolites	3(2-3)			4
5	THP221	Biochemistry of Aquatic Products	3(2-3)	BIK200		4
6	THP222	Aquatic Products Microbiology	3(2-3)	BIO210		4
7	THP231	Aquatic Products Processing Technology I	3(2-3)		5	
8	THP313	Handling of Aquatic Products	3(2-3)		5	
9	THP223	Testing of Raw Materials and Aquatic Products	3(2-3)	THP221	5	
10	THP332	Technology of Aquatic Traditional Product	3(2-3)		5	
11	THP325	Fermentation of Aquatic Products	3(2-3)	BIO210 THP222	5	

No.	Courses		credits	Prerequisite	Semester	
	Code	Name			Odd	Even
12	THP333	Diversification and Development of Aquatic Products	3(2-3)	THP200	5	
13	THP323	Aquatic Products Biotechnology	3(2-3)	KIM101 BIO100	5	
14	THP337	Waste Treatment Technology and Utilization of Aquatic By-Products	3(2-3)	THP231		6
15	THP338	Chitin and Chitosan Processing Technology	3(2-3)			6
16	THP301	Standardization and Integrated Quality Assurance	3(2-3)			6
17	THP339	Aquatic Product Industrial Planning	3(2-3)	THP231		6
18	THP336	Marine Plant Industry Technology	3(2-3)	THP200		6
19	THP326	Aquatic Products Pharmaceuticals	3(2-3)	KIM101 THP222		6
20	THP315	Transportation Technology of Aquatic Products	3(2-3)			6
21	THP411	Introduction to Design Practical test tools and Quality Detection Methods for Aquatic Raw Materials	3(2-3)		7	
22	THP421	Aquatic Biotoxicology	3(2-3)	THP221	7	
23	THP401	Field Practice	2(0-5)	THP301	7	
24	THP491	Seminar	1		Odd	Complete
25	THP492	Final project (Thesis)	6		Odd	Complete
Sub Total credits			75			
Elective Major/Major And Supporting Course (SC)						
1	MSP401	FieldWork	3		7	
2	FPK301	Fisheries and Marine Entrepreneurship	3(2-3)		√	
3	KPM210	Basics of Communication	3(2-3)		√	√
4	MAN111	Introduction to Management	3(3-0)		√	√
5	THP431	Development of Aquatic Products Processing Technology	3(2-3)			6
6	TIN240	Packaging, Distribution and Transportation Technology	3(2-3)		5/7	
7	THP432	Industrial Liquid Waste Treatment and Recovery Technology of Aquatic Products	3(2-3)			6
8	THP214	Basics of Microscopic Analysis of Raw Materials and Aquatic Products	3(2-3)			4/6

Course Description

1. THP200 Basics of Aquatic Product Technology 3(2-3)

This course presents material on the scientific overview of Aquatic Product Technology (THP) and general studies of each division in THP including the handling and processing industry of aquatic products, the aquatic product biotechnology industry and the aquatic product quality management system.

THP Department Team

2. THP201 Scientific Paper Methods 3(2-3)

This course includes understanding of research philosophy, methods, and logic of thinking in research, philosophy, research design, writing according to scientific principles related to the field of Aquatic Product Technology.

THP Department Team

3. THP301 Standardization and Integrated Quality Assurance 3(2-3)

This course provides mastery of the philosophy of standardization, explains and illustrates the importance of standardization in all aspects of life, quality infrastructure in the context of quality and competitiveness, identification of standards for application in the field of THP, and behavior / culture standards / quality (SSOP, GMP, HACCP, SMKP and ISO 9001).

Wini Trilaksani (Coord), Nurjanah, Iriani Setyaningsih, Desniar, Bambang Riyanto

4. THP401 Field Practice 2(0-5)

Prerequisite: THP301

The Field Practice (PL) course is integrated with the Standardization and *Integrated Quality Assurance* courses, which are carried out in the aquatic product processing industry. Objectives: improve students' knowledge and skills about operating units, the application of quality management system standards for aquatic product safety, and the preparation of HACCP *plans*.

THP Department Teaching Team

5. **THP211 Introduction of Aquatic Products Industrial Raw Materials 3(2-3)**

This course discusses various types of aquatic commodities (biota) that can be used as raw materials for the aquatic products industry and their current and future utilisation prospects by paying attention to aspects of biology, composition, markets and competitors, both food and non-food that have economic value.

Nurjanah (Coord), Asadatun Abdullah, Mala Nurilmala

6. **THP212 Physiology, Formation and Degradation of Aquatic Metabolites 3(2-3)**

This course provides an explanation of the physiology, metabolism formation and degradation of metabolites to the quality of raw materials, factors that affect the composition and properties of raw materials and can choose the best physiological conditions to be utilized by applying physical and chemical tests of materials.

Tati Nurhayati (Coord), Nurjanah, Roni Nugraha

7. **THP313 Handling of Aquatic Product Technology 3(2-3)**

This course provides an explanation of post-harvest handling technology of aquatic products (especially economically important fish and non-fish) and the impact of such handling on the deterioration of its quality, from the time it is lifted from the water, handling after being caught to the last consumer.

Mala Nurilmala (Coord), Ruddy Suwandi

8. **THP315 Aquatic Product Transportation Technology 3(2-3)**

This course presents material on knowledge and provides skills in handling aquatic products before, during the process- and after the transportation process which has important economic value. Modes of transportation as well as shutter prasaand its means were also discussed accompanied by case studies in the field.

Ruddy Suwandi (Coord), Nurjanah, Mala Nurilmala

9. **THP411 Introduction to Practical Test Equipment Design and Quality Detection Methods of Aquatic Raw Materials 3(2-3)**

Prerequisites: THP211, THP212 and THP223

This course discusses the basics of detection methods and the design of practical test equipment for determining the quality of aquatic raw materials including quality deterioration theory, compounds that can be used as molecular targets or complements in the design of practical test equipment, the theory of detecting the quality of aquatic raw materials based on physical and chemical changes, as well as examples of developing methods or practical test equipment for aquatic raw materials.

Asadatun Abdullah (Coord), Mala Nurilmala, Roni Nugraha

10. **THP221 Biochemical Aquatic Yield 3(2-3)**

Prerequisite: BIK200

This course includes material on the biochemical scope of aquatic products, which includes: the complexity and linkage of biochemical reactions of the main nutritional components and enzymes as well as the role of the constituent components.

Sri Purwaningsih (Coord), Kustiariyah, Safrina Dyah H

11. **THP222 Aquatic Yield Microbiology 3(2-3)**

Prerequisite : BIO210

This course will discuss the scope, habitat and physiology of microorganisms, the diversity and role of aquatic microorganisms (prokaryotes and eukaryotes), pathogenic microorganisms and causes of damage to aquatic products, the interaction of pathogenic microbes in humans and their control as well as sanitation and hygiene of aquatic products.

Iriani Setyaningsih (Coord), Desniar, Kustiariyah, Safrina Dyah H

12. **THP223 Testing of Raw Materials and Aquatic Products3(2-3)**

Prerequisite: THP221

This course provides students with knowledge and skills on ways of chemical, physical, and organoleptic analysis related to the quality of raw materials and aquatic products.

Linawati H (Coord), Safrina Dyah H, Kustiariyah

13. **THP325 Fermentation of Aquatic Products3(2-3)**

Prerequisite: BIO212, THP222

This course discusses the history of fermentation and the properties of fermentation products, the types and processes of fermentation of aquatic products, microorganisms that participate in physical, chemical and microbiological changes during fermentation and the application of biotechnology in the development of fermented products from waters.

Desniar (Coord), Iriani Setyaningsih, Kustiariyah

14. **THP326 Aquatics Pharmaceutics3(2-3)**

Prerequisite: KIM101, THP222

This course discusses a variety of natural ingredients (alkaloids, terpenoids, flavonoids, steroids, peptides, carotenoids, pigments, melanin) from potential marine resources in the development of pharmaceutics and cosmetics. This discussion includes sources, ways of isolating and characterising natural materials from aquatic products, testing methods both quantitatively and qualitatively, as well as their application and development potential.

Kustiariyah (Coord), Iriani Setyaningsih, Desniar, Linawati H

15. **THP323 Aquatic Biotechnology3(2-3)**

Prerequisite: KIM101, BIO100

The aquatic biotechnology course discusses the application of biotechnology in general in the field of fisheries and marine affairs which includes the development of aquatic natural products, control of aquatic pollution and aquaculture. Furthermore, strategies for developing biotechnology products / processes from aquatic biological resources, various kinds of screening techniques for the development of aquatic active materials, the basics of microalgae biotechnology are discussed.

Linawati H (Coord), Iriani Setyaningsih, Kustiariyah

16. **THP421 Aquatic Biototoxicology3(2-3)**

Prerequisite: THP221

This course provides students with knowledge about fish and other aquatic biota that are cytotoxins, marine toxins, toxins that exist due to pollution and processing as well as ways of separation and purification, analysis and utilisation of toxins.

Sri Purwaningsih (Coord), Iriani Setyaningsih, Safrina Dyah H

17. **THP231 Aquatic Products Processing Technology I3(2-3)**

This course discusses the principles of processing, and various processing technologies of aquatic products, which utilise low temperature technology, high temperature and water content modification, in order to maintain durability, design product quality, and provide added value to aquatic raw materials.

Busmtami Ibrahim (Coord), Uju

18. **THP332 Traditional Products Technology Aquatic Products3(2-3)**

This course studies the meaning, characteristics, processes, and various problems in traditional processing, studies processing techniques, the influence of physical, chemical, and environmental conditions on traditional

processes and products, and studies various forms of technology for the processing process of traditional aquatic products and their development prospects in the future.

Sugeng Heri S (Coord), Heru Sumaryanto, Desniar

19. **THP333 Diversification and Development of Aquatic Products3(2-3)**

Prerequisite: THP200

The course teaches the students to be able to understand the theoretical concepts of science and technology of product development, formulation, application in the development and commercialisation of value-added products from water products, the manufacture of new products that have the potential to be commercialised and contribute to the creation of fish protein food sovereignty, estimation of shelf life, packaging and labelling.

Wini Trilaksani (Coord), Bambang Riyanto

20. **THP337 Waste Treatment and Utilisation Technology Water Byproduct3(2-3)**

Prerequisite: THP 231

This course discusses the science and technology of utilising, managing and developing value-added products from waste and by-products of the aquatic industry for food, pharmaceuticals, medicine, agricultural cultivation, fisheries, livestock production, renewable materials in other industries, such as textiles, creative industries, electronics, and bioenergy as well as the creation of an integrated and sustainable industrial and aquatic product business design.

Bambang Riyanto (Coord), Wini Trilaksani

21. **THP338 Chitin and Chitosan Processing Technology3(2-3)**

This course provides a basic understanding of the description and physico-chemical properties of chitosan chitin, sources of raw materials, chemical composition, manufacturing methods, applications in various fields and their development.

Sugeng Heri S (Coord), Pipih Suptijah

22. **THP339 Aquatic Products Industrial Planning3(2-3)**

Prerequisite: THP231

This course discusses the principles in planning the fishery product industry starting from product development planning to the stage of operating planning and controlling production.

Bustami Ibrahim (Coord), Uju

23. **THP336 Marine Plant Industry Technology3(2-3)**

Prerequisite: THP200

This course provides knowledge to students to be able to explain the biology, ecology and physiology of marine plants; specific components of high economic value (hydrocolloids) produced from each type of marine plants including secondary metabolites, their extraction process, the use of these components in the food and non-food fields, as well as the utilisation of extracted waste into value-added products.

Joko Santoso (Coord), Uju, Heru Sumaryanto

24. **THP431 Development of Aquatic Product Technology3(2-3)**

Prerequisite: THP231

This course discusses the principles of processing, and various aquatic product processing technologies, which utilise high temperature technology, extrusion technology, frying pans, microwave technology, packaging to improve the quality and added value of products.

Uju (Coord), Bustami Ibrahim

25. **THP432 Industrial Waste Treatment and Recovery
Aquatic Results3(2-3)**

This course discusses the meaning of liquid waste and the consequences of its pollution burden on the environment with several processing technologies (physically, chemically and biologically) to be safe for the environment, and explains the technology to *recover* some of the compounds contained such as proteins, fats and other compounds that can be value-added products.

Bustami Ibrahim (Coord), Uju

26. **THP214 Basics of Microscopic Analysis of Raw Materials
and Aquatic Products3(2-3)**

This course discusses macro and product photography related to the microscopic characteristics of flora and fauna from waters as raw materials for processing and processed products.

Agoes M. Jacobeb (Coord), Asadatun Abdullah

27. **THP491 Seminar1**

Submission of research results scientifically, both oral and written

THP Department Teaching Team

28. **THP492 Thesis6**

Problem review based on scientific rules in the form of a research project which includes the background / formulation of the problem, research objectives, research methods including experimental design and data analysis to answer problems draw conclusions from the results of the *experiment* obtained.

THP Department Teaching Team

Department of Forest Resources Conservation and Ecotourism

Courses	:	Forest Resources Conservation and Ecotourism
Learning Outcomes	:	<ol style="list-style-type: none"> 1. Able to apply the field of Forest Resources Conservation and Ecotourism and utilise science, technology, and / or art in the field of Forest Resources Conservation and Ecotourism in solving problems and able to adapt to the situation at hand. 2. Mastering the theoretical concepts in the field of forest resource conservation in general and theoretical concepts of conservation management, wildlife management, plant diversity conservation, utilisation of ecosystem services, and ecotourism management, in depth, and able to formulate procedural problem solving. 3. Able to make the right decisions based on information and data analysis, and able to provide instructions in choosing various alternative solutions independently and in groups. 4. Responsible for own work and able to take responsibility for the achievement of organisational work results
Minor	:	Natural Tourism Management and Environmental Services
Learning Outcomes	:	Able to apply and master the theoretical concepts of natural tourism management and environmental services
Minor	:	Wildlife Management
Learning Outcomes	:	Able to apply and master the theoretical concepts of wildlife management
Minor	:	Plant Diversity Conservation
Learning Outcomes	:	Able to apply and master the theoretical concepts of plant diversity conservation.

Curriculum Structure

No.	Courses		credits	Prerequisite	Semester	
	Code	Name			Odd	Even
General Competency Education Courses						
1	IPB100-104/110	Religion	3(2-2)		1	
2	AGB100	Introduction to Entrepreneurship	1(1-0)			2
3	BIO100	Biology	3(2-3)		1	
4	EKO100	General Economy	3(2-2)		1	
5	FIS100	Physics	3(2-3)			2
6	IPB106	Indonesian	2(1-2)		1	
7	IPB107	Introduction to Agricultural Sciences	2(2-0)		1	
8	IPB108	English	3(2-2)			2
9	IPB111	Pancasila Education	2(1-2)			2
10	IPB112	Sports and Arts	1(0-3)			2
11	KIM101	Chemistry	3(2-3)		1	
12	KPM130	General Sociology	3(2-2)			2
13	MAT101	Foundations of Mathematics	3(2-2)		1	
Sub total credits			33			
Interdepment Course						
1	MNH201	Introduction to Forestry Science and Environmental Ethics	2(2-0)			2
2	HHT201	Forest Products as Raw Materials	2(2-0)		3	
3	HHT202	Forest Product Processing	2(2-0)		3	
4	MNH211	Soil Measurement and Area Mapping Science	3(2-3)	MAT101	3	
5	FHT100	General Practice of Forestry	3			4-5
6	MNH212	Forest Resource Inventory	3(2-3)	SVK211, MNH211		4
7	MNH331	Forest Harvesting	3(2-3)		5	
8	MNH314	Forest Management	3(2-3)			6
9	STK211	Statistical Methods	3(2-2)		3	
10	SVK211	Dendrology	3(2-3)		3	
11	SVK212	Forest Ecology	3(2-3)			4
12	SVK322	Silviculture	3(2-3)		5	
Sub Total credits			33			
Major Courses						
1	KSH201	Conservation of Biological Natural Resources	2(2-0)			2
2	KSH211	Wildlife Ecology	3(2-3)		3	4

No.	Courses		credits	Prerequisite	Semester	
	Code	Name			Odd	Even
3	KSH212	Wildlife Behavior	3(2-3)			4
4	KSH213	Ex-Situ Wildlife Conservation	2(2-0)		3	4
5	KSH221	Conservation Policy and Institutions	2(2-0)		3	4
6	KSH222	Conservation Planning	2(2-0)			4
7	KSH251	Nature Recreation and Ecotourism	3(2-3)		3	4
8	KSH252	Conservation Education	3(2-3)			4
9	KSH314	Wildlife Inventory and Monitoring	3(2-3)		5	6
10	KSH315	Wildlife Breeding	3(2-3)			6
11	KSH316	Feed Management and Wildlife Health	3(2-3)			6
12	KSH323	Conservation Area Management	3(2-3)		5	6
13	KSH332	Forest Ethnobiology	2(2-0)		5	6
14	KSH341	Environmental Pollution	2(2-0)		5	6
15	KSH342	Spatial Analysis of the Environment	3(2-3)			6
16	KSH343	Environmental Services Management & Impact Control	2(2-0)			6
17	KSH353	Interpretation of Nature	3(2-3)		5	6
18	KSH398	Scientific Writing Methods	2(1-3)		5	
19	KSH417	Wildlife Management	3(2-3)		7	
20	KSH433	Tropical Forest Medicinal Plant Conservation	3(2-3)		7	
21	KSH444	Urban Forest Science	3(2-3)		7	
22	FHT300	Thematic Real Work Lectures	3(0-3)			6-7
23	KSH498	Seminar	1			8
24	KSH499	Thesis	6			8
Sub Total credits			65			

Minor: Natural Tourism Management and Environmental Services

No.	Courses		credits	Prerequisite	Semester	
	Code	Name			Odd	Complete
1	KSH251	Nature Recreation and Ecotourism	3(2-3)		3	4
2	KSH252	Conservation Education	3(2-3)			4
3	KSH323	Conservation Area Management	3(2-3)		5	6
4	KSH343	Environmental Services Management & Impact Control	2(2-0)			6
5	KSH353	Interpretation of Nature	3(2-3)		5	6
Total credits			14			

Minor: Wildlife Management

No.	Courses		credits	Prerequisite	Semester	
	Code	Name			Odd	Complete
1	KSH211	Wildlife Ecology	3(2-3)		3	4
2	KSH212	Wildlife Behavior	3(2-3)			4
3	KSH213	Ex-Situ Wildlife Conservation	2(2-0)		3	4
4	KSH314	Wildlife Inventory and Monitoring	3(2-3)		5	6
5	KSH417	Wildlife Management	3(2-3)		7	
Total credits			14			

Minor: Plant Conservation

No.	Courses		credits	Prerequisite	Semester	
	Code	Name			Odd	Complete
1	KSH323	Conservation Area Management	3(2-3)		5	6
2	KSH332	Forest Ethnobiology	2(2-0)		5	6
3	KSH342	Spatial Analysis of the Environment	3(2-3)			6
4	KSH433	Tropical Forest Medicinal Plant Conservation	3(2-3)		7	
5	KSH444	Urban Forest Science	3(2-3)		7	
Total credits			14			

Course Description

1. **KSH201 Conservation of Biological Natural Resources 2(2-0)**

History and problems of conservation of biological natural resources and their ecosystems; threats to tropical biodiversity; conservation movement; the concept of natural resources; principles of conservation ecology; conceptual underpinnings of conservation of biological natural resources; scarcity and extinction; biodiversity conservation strategies.

Sambas Basuni (Coord), Haryanto R. Putro, Arzyana Sunkar, Rineko Soekmadi, Yeni Aryati Mulyani, Rachmad Hermawan, Dones Rinaldi, Agus Priyono Kartono, Harnios Arief, Tutut Sunarminto, Nandi Kosmaryandi

2. **KSH211 Wildlife Ecology 3(2-3)**

History, scope and purpose; the usefulness of animal ecology and the relationship between animal ecology and other sciences; the potential and value of wildlife; *zoogeography*; components and habitat types of wildlife; wildlife in the context of individuals and populations; wildlife population growth; movement and dissemination of wildlife; species interactions; application of wildlife ecology.

Abdul Haris Mustari (Coord), Ani Mardiasuti, Yeni Aryati Mulyani

3. **KSH212 Wildlife Behavior 3(2-3)**

The history of the development of animal behavior science; the importance of animal behavior in wildlife management; development of animal behavior; basic mechanisms of animal behavior; motivation and learning process, classification and patterns of behavior; communication behavior, social and reproductive behavior, home range, territory, migration and spatial orientation; introduction to animal behavior research methods.

Dones Rinaldi (Coord), Yeti Aryati Mulyani

4. **KSH213 Conservation Ex-Situ Satwaliar 2(2-0)**

Definitions, limitations, and scope of exitu conservation, the role of ex-situ conservation in supporting in-situ; management of animal genetic diversity, analysis of animal genetic viability; reintroduction technologies: introduction, rehabilitation, *restocking*, exitu conservation methods, freeze preservation, *genomic libraries*, measurement, and utilisation of genetic diversity: selection, migration, mutation, and *genetic drift*.

Burhanuddin Masy'ud (Coord), Ani Mardiasuti, Lin Nuriah Ginoga, Agus Priyono Kartono, Dede Aulia Rahman

5. **KSH221 Conservation Policy and Institutions2(2-0)**

Understanding policies and the importance of laws and regulations in the context of conservation of biological natural resources; the principle of sovereignty in resource management; the values and ethics of conservation of biological natural resources; international conventions and ethics; national policy; conservation legislation; CITES and CBD.

Haryanto R. Putro (Coord), Sambas Basuni, Rineko Soekmadi

6. **KSH222 Conservation Planning2(2-0)**

Understanding and socio-economic importance of conservation; economic-environmental-conservation relations; the social and economic benefits of conservation; externalities and benefits of conservation; CVM (*contingency valuation method*) on biological resources; natural resource valuation method; socio-cultural benefits of natural resources in conservation areas.

Haryanto R. Putro (Coord), Harnios Arief, Tutut Sunarminto

7. **KSH251 Nature Recreation and Ecotourism3(2-3)**

Definition of recreation in the outdoors, *demand* and *supply* of natural recreation; natural recreation planning; visitor management and the socioeconomics of natural recreation.

E.K.S. Harini Muntasib (Coord), Eva Rachmawati, Arzyana Sunkar, Nandi Kosmaryandi, Siti Badriyah Rushayati, Ani Mardiasuti

8. **KSH252 Conservation Education3(2-3)**

Understanding and importance of conservation education in the context of awareness of natural resource conservation; basic concepts and approaches to conservation education methods; planning and designing conservation education; implementation of conservation education

E.K.S. Harini Muntasib (Coord), Burhanuddin Masy'ud, Siti Badriyah Rushayati, Eva Rachmawati

9. **KSH314 Animal Inventory and Monitoring3(2-3)**

Understanding, using, and applying direct and indirect inventory techniques for estimating wildlife populations. In addition to the basic understanding of sampling, censuses, and sampling, methods of inventorying and monitoring of wildlife according to taxon are also provided including mammals, birds, and herpetofauna.

Yanto Santosa (Coord), Abdul Haris Mustari, Yeni Aryati Mulyani, Mirza Dikari Kusri, Dede Aulia Rahman

10. **KSH315 Wildlife Breeding3(2-3)**

Definition and system/form of captivity, wildlife *breeding* ; procurement of seeds, capture and transportation; immobilisation; adaptation and acclimatisation; design of artificial housing and habitats; animal nutrition; animal health and disease; reproduction; harvesting and post-harvest technology; breeding qualification standards; animal breeding business design; business feasibility analysis.

Burhanuddin, Masy'ud (Coord), Agus Priyono Kartono, Lin Nuriah Ginoga, Muhammad Agil

11. **KSH316 Feed Management and Wildlife Health3(2-3)**

Understanding animal feed, the role of feed management and health for wildlife conservation; the basics of animal nutrition science; analysis of animal feed needs and preferences; techniques for ration preparation and animal feed processing; introduction to animal feed research; disease category: symptoms and causes of the disease; categories of bacterial and viral zoonotic diseases and their countermeasures; metabolic and reproductive diseases and their countermeasures; animal health care; introduction to animal disease research.

Lin Nuriah Ginoga (Coord), Burhanuddin Masy'ud, Muhammad Agil

12. **KSH323 Conservation Area Management3(2-3)**

Understanding and objectives of conservation area management; perspectives on conservation area management; categories of conservation areas; basic principles of conservation area management; site selection of conservation areas; conservation area planning; regional management approaches: participation and collaboration; management of buffer areas; evaluation of the effectiveness of area management.

Sambas Basuni (Coord), Rinekso Soekmadi, Harnios Arief, Tutut Sunarminto, Arzyana Sunkar, Haryanto R. Putro, Nandi Kosmaryandi

13. **KSH332 Forest Ethnobiology2(2-0)**

History, understanding and development of forest ethnobiology; the principles of the self-system and examples of the application of the system of selfhood in ethnobiology; traditional wisdom of the community in the use of biological natural resources; forest ethnobiological methods; ethnopharmacology; the sorting and shape of traditional yards and their biodiversity; ethnozoology.

Ervisal A.M. Zuhud (Coord), Agus Himat, Edhi Sandra, Siswoyo, Syafitri Hidayati

14. **KSH341 Environmental Pollution2(2-0)**

Sources of pollution, processes, influences /impacts of polluters on the environment as well as ways of controlling and monitoring, as well as efforts to improve environmental quality; the role/function and benefits of vegetation in pollution control and improving environmental quality.

Siti Badriyah Rushayati (Coord), Rachmad Hermawan, Mirza Dikari Kusri, Agus Priyono, Yudi Setiawan

15. **KSH342 Spatial Analysis of the Environment3(2-3)**

The concept of spatial data; spatial approach in analyzing the environment/landscape; formation of spatial data; *global positioning system*; formation of spatial data; quality of spatial data; spatial data analysis.

Lilik Budi Prasetyo (Coord), Yudi Setiawan

16. **KSH343 Environmental Services Management and Impact Control 2(2-0)**

Environmental services as water management regulators, oxygen providers, reducing air pollutants, maintaining soil fertility, biodiversity, preventing erosion and flooding, and the environment as an ecotourism service provider. In addition, this course also explains how to manage environmental services and control the impact of utilisation.

Agus Priyono (Coord), Rachmad Hermawan, Siti Badriyah Rushayati, Tutut Sunarminto

17. **KSH353 Interpretation of Nature3(2-3)**

Understanding the interaction of nature and its elements, namely objects, paths, programs, themes, types and techniques of interpretation as well as planning and management of natural interpretation.

E.K.S. Harini Muntasib (Coord), Yeni Aryati Mulyani, Arzyana Sunkar, Nandi Kosmaryanto, Eva Rachmawati

18. **KSH398 Research Methodology2(1-3)**

Understanding and various scientific research methods; formulation of problems and research objectives; formulation of hypotheses; study of literature; development of research methodologies; taking respondents/examples; development of questionnaires; analysis and presentation of data; discussion of research results; drawing conclusions; procedures for scientific presentation/writing.

Burhanuddin Masy'ud (Coord), Yeni Aryati Mulyani, Mirza Dikari Kusri, Dede Aulia Rahman

19. **KSH417 Wildlife Management3(2-3)**

Understanding and limitations of wildlife management; principles of wildlife management; management (fostering) of populations; management (development) of habitats; forms of wildlife management; handling of wildlife disturbances.

Jarwadi Budi Hernomo (Coord), Nyoto Santoso, Yanto Santosa

20. **KSH433 Tropical Forest Medicinal Plant Conservation2(2-0)**

Understanding and scope of conservation of tropical forest medicinal plants; scarcity and extinction of plant species; conservation strategies of tropical forest medicinal plants; review of the potential of Indonesian medicinal plants; introduction of superior medicinal plant species; utilisation problems and prospects for the development of Indonesian medicinal plants; captivity of medicinal plants; development of bioregional-based medicinal plants; bioprospection and patents; commercialisation / entrepreneurship of Indonesian medicinal plants.

Ervizal A.M. Zuhud (Coord), Agus Hikmat, Edhi Sandra, Siswoyo, Syafitri Hidayati

21. **KSH444 Urban Forest Science3(2-3)**

Understanding the city and its problems; the notion of urban forests; problems and their benefits in environmental management; determination of the area, type and shape of urban forests; type selection, planting and tree care in urban forests; stages of urban forest development planning.

Rachmat Hermawan (Coord), Siti Badriyah Rushayati, Lilik Budi Prasetyo

22. **FHT300 Forestry Field Practice3 (0-3)**

Forestry Field Practice activities in the form of introducing the types of forest ecosystems and observing and measuring components of forest ecosystems, natural forests and plantation forests from the coast to the mountains. The ecosystem components observed are wildlife components, soil physique (soil and climatic factors), behavior, interactions between ecosystem components, and the benefits of each type of forest ecosystem for life as well as the introduction of forest status and function. In addition, it also recognises and carries out activities within the scope of forest management including forest planning materials, forest development, forest protection, timber and non-timber harvesting, timber and non-timber forest products industry, community forestry and conservation of biological natural resources.

Teaching Team

23. **FHT300 Thematic Real Work Lecture 3(0-3)**

24. **KSH498 Seminar** 1

25. **KSH499 Thesis** 6