

STUDENT HANDBOOK



**BACHELOR BIOLOGY
FACULTY OF
MATHEMATIC AND SCIENCES**







Student Handbook Bachelor in Biology



Faculty of Mathematics and Sciences
The University of Jember
2019



Foreword

We thanks to the God Almighty for His blessings and gifts so that the Student Handbook of the Bachelor Biology, Faculty of Mathematics and Natural Science, University of Jember (UNEJ) has been completed. As the name implies, this book is structured to guide students in undergoing lectures in Bachelor Biology.

This book also aims to introduce students to various organizations, activities, and facilities available at University of Jember. Thus, students can develop themselves optimally when pursuing a Bachelor study at UNEJ.

We always accept criticism, and suggestions from various parties for the improvement of this book in the future.

Jember, July 2019

Editor Team



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Symbol The University of Jember)



The symbol of the University of Jember is an equilateral pentagon with curved sides in which

there is writing and an imaginary circle formed by objects with the following meanings:

1. The imaginary circle illustrates the people's determination to establish the University of Jember.
2. Three fresh tobacco leaves, symbolizing the Tri Dharma of Higher Education.
3. Tobacco, rice, and corn leaves symbolize the fertility of the former Besuki Residency, as an agricultural area and producer of export tobacco, where the University of Jember grew and developed.
4. The strap root symbolizes Panca Bharata, consisting of rational (reason), spirit (spirit and courage), idealism (ideals), ethics (humanity), and realism (reality).
5. The flame symbolizes the fighting spirit of the people (the area of the Assistant Governor Besuki) and its surroundings which provided the creation of the University of Jember.
6. Seven grains of rice symbolize the seven people who had sat on the Committee of Seven which was formed by the Minister of PTIP in 1962 in the effort to establish the University of Jember.
7. The pentagonal container symbolizes the basic philosophy of the state, namely Pancasila.
8. The basic color of pentagonal container is yellow, tobacco leaves, rice leaves, and corn leaves are green; rice is golden; flame, tie rods, inscription, and outline black pentagons are black. The black color symbolizes firmness and fertility in science. Green symbolizes the hope of fertility and freshness of the soul, yellow symbolizes dynamics and silence and holiness for people who glorify God Almighty



Hymne The University of Jember

Do = E, 4/4
MAESTOSO
Arr: Moordiana

Lyrics: Drs. Soejono
Song: Drs. Gunawan H

S	5.	1 3 3	<u>2</u>	3	5	<u>35</u>	5 5 2 1	2	.	0	<u>23</u>
A	<u>5.</u>	1 . 1	<u>67</u>	1	.	<u>17</u>	1 1 6 1	7	.	0	<u>21</u>
T	<u>54</u>	3 5 5 4		5	.	<u>32</u>	3 3 4	5	.	0	<u>43</u>
B	5.	1 7. 6.	5.	1	.	<u>5.5.</u>	1 7. 6. 2	5.	.	0	<u>5.5.</u>

S	4 4 4	<u>32</u>	1 3 5	<u>55</u>	5 4 3 2	3 . 0 13	2 5 1 2
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T	4 6 5	<u>54</u>	3 3 5	<u>55</u>	5 6 5 6	5 . 0 5	4 2 3 4
B	2 1 7.	<u>17.</u>	6. 5. 3.	<u>21</u>	7. 6. 5. 5.	1 . 0 1	<u>21</u> <u>7.6.</u> 5. 5.

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T	5 . 5	<u>55</u>	1 1 6 1	5	.	0	6	<u>6</u>	4 4	5	.	5	5
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A	2 2 1 7.	1 . 0 5	1	.	7.	2	2	1	<u>12</u>	3 3 6. 1
T	7 6 5 4	3 . 0 4	3	.	5 4	6	4	3	<u>55</u>	1 1 4 4
B	2 2 5 5	1 . 0 5	1	6.	5. 67.	1	1	32		1 7. 6. 2

S	2 . 0	<u>23</u>	4 4 4	<u>54</u>	1 3 5	<u>55</u>	5	<u>54</u>	3 2	1 . 0 5.
A	2 1 7.	<u>21</u>	1 1 2	<u>32</u>	1 7. 1	<u>7.1</u>	2	<u>22</u>	1 7.	1 . 0 5.
T	5 . 0	<u>55</u>	6 6 7	<u>54</u>	3 5 1	<u>55</u>	5	<u>56</u>	5 4	1 . 0 5
B	7. 6. 5.	<u>5.5.</u>	4. 4. 5.	<u>17.</u>	1 3 3	<u>21</u>	7.	<u>7.6.</u>	5. 5.	1 . 0 5.

S	3 .3	<u>24</u>	<u>32</u>	1	.	1	5	5	<u>5</u>	4 3	2 . 0 2	3	.	4 .
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T	3 .3	<u>24</u>	<u>32</u>	1	.	1	54	3	<u>3</u>	4 6	5 . 0 5	5	.	4 5
B	3 .3	<u>24</u>	<u>32</u>	1	.	1	32	1	<u>1</u>	6. 6.	5. . 0 5.	1	.	6. 7.

S	5 . 1	3	3 2 1	<u>7.</u>	1 . 0
A	1 . 1	1	7. 7. 1	<u>5.</u>	5 . 0
T	3 . 3	4	5 4 4	2	3 . 0
B	5 . 6.	6.	7. 5. 6.	5.	1 . 0

SE MI PE NERUS BANGSA MU



Profile of Bachelor Biology

Since its inception, the vision, mission, goals and objectives have been prepared by the Biology Study Program *Task Force* Team in 1997 based on the results of an internal analysis of human resources owned and external analysis, especially related to the challenges of the era of globalization and progress in the field of biology at that time. In addition, the mechanism for the preparation and revision of the vision, mission, goals and objectives is also implemented by taking into account the academic development of the National Biology Curriculum Policy and taking into account the competency needs of graduates who expected by the job market for graduates of the Biology study program, FMIPA, University of Jember (UNEJ).

Based on the results of the evaluation of the suitability of the vision and mission to the demands of *stakeholders*, both internal and external, it is necessary to improve the vision and mission. The development of demands from external stakeholders which has implications for the responsibility of the study program in conserving the wealth of tropical biological natural resources (SDA) in Indonesia and local uniqueness, especially in the Jember area and its surroundings while still considering the human resources owned by the study program, the Biology undergraduate study program needs to change its vision, mission goals and objectives are expected to provide impact on the quality of learning, research, service that contributes to the exploration and conservation of tropical biological natural resources through the formulation of the vision and mission of the new S1 Biology study program which was set in 2011. The determination of the new vision and mission is in line with the FMIPA and UNEJ vision and mission.

The improvement of the vision and mission is carried out by involving all components, including the head of study programs, lecturers, education staff, *stakeholders*, alumni and students, as well as the faculty. The process of compiling and improving the vision and mission is carried out by collecting data obtained through questionnaires, utilizing social media and electronic mail, laboratory meetings / scientific groups, and PS-S1 Biology meetings. The data collected is followed by a SWOT (*Strength Weakness, Opportunity, & Threats*) analysis which is written in the form of a Self-Evaluation of the Biology Undergraduate Study Program.

In the process of collecting data on the needs of *stakeholders*, the Biology Undergraduate Study Program accommodates the results of comparative studies, workshops, research, and the implementation of national and international collaborations. In particular, for the national level cooperation the Biology study program is benchmarking to PS - S1 Biology major universities in Indonesia (UGM, UB, UNAIR, and IPB) as well as efforts to develop academic performance of study programs in the form of expanding international network collaboration with universities abroad such as Europe (Kassel University), Japan (Osaka University and Hiroshima University), and Korea (Gyongsang National University and Kyungpook National University).



On the other hand, the field of biological sciences has a very strong relevance to the issues or problems faced by the world, especially in the field of environmental conservation. Therefore, the Undergraduate Biology study program is called to pay attention to global problems which include humanitarian and environmental problems. In addition, the Biology S1 study program also considers the growth of local wisdom in environmental conservation. This is in line with the university's policy as stated in the university's vision, namely excelling in the development of science and technology, environmental insight, business, and industrial agriculture. The results of the evaluation of the vision and mission direct the strengthening of policies to play an active role in solving global problems that are used as the basis for improvementvi content m contents , goals and objectives of the Biology S1 study program .

The results of the formulation of the following vision, mission, goals, and objectives of the Biology S1 study program are discussed in the faculty senate to be determined as the vision and mission of the Biology S1 study program. The vision and mission of the Biology S1 study program is contained in : (1) UNEJ academic guidelines, (2) the annual Biology undergraduate work plan and (3) quality guidelines and work procedures for the Biology undergraduate study program .



Vision and Program Objectives (POs)

Vision

The Biology Study Programme becomes an excellent programme in the field of biosciences oriented to the tropical biological resources management that are environmentally sound and globally competitive.

Programme Objectives (POs)

The Programme Objectives (POs) of the Bachelor in Biology is formulated based on the vision, stakeholders needs and requirements, competencies, and tracer study. The study programme can produce graduates who

1. are excellent and have good ethics in implementation the bioscience for bio-entrepreneurs and problem solving related to the management of tropical biological resources with better environmental awareness
2. are responsive and adaptive to the development of science and technology
3. are professional, independent, collaborative, communicative and responsible work culture as well as being able to demonstrate good leadership in the work environment and society
4. are able to continue their study in the fields of biology and other related fields



Address and general info

Institution/University	: University of Jember
Faculty	: Mathematics and Natural Sciences
Department	: Biology
Study Program	: Bachelor in Biology
Graduate Degree	: Bachelor of Science (S.Si.)
Date of Establishment	: April 16 th 2001 by Decree 98/DIKTI/Kep/2001
Address	: Kalimantan Street 37 Jember-East Java 68121
Phone Number	: 0331–338696
Website	: http://biologi.fmipa.unej.ac.id/?page_id=434
e-mail	: biologi.fmipa@unej.ac.id
Study Program Code	: 1810401
Study Program Accreditation	: B by BAN PT No. 13711/SK/BAN-PT/Ak-PPJ/S/XII/2021, dated December 28 th 2021, effective date December 28 th 2021 to December 28 th 2026
Name of Final Award	: Bachelor of Science
Admission Criteria or Requirements to The Program	: 1. High School Graduated 2. Passing one of the new student enrolment scheme
Model of Study	: Full Time
Total of Credits	: 144 credits; ECT: 217.44
Language of Study	: Indonesian and/or combined with English
Duration	: 4 years (8 semesters)



Graduate Profile and Programme Learning Outcome

Graduate Profile

The Graduates of the Bachelor in Biology are expected to be able to take part as a) research assistants in the fields of biology and the environment; b) quality control staff; c) bio-entrepreneur (Table 1).

Table 1. Description of the Graduate's Profile of the Bachelor in Biology

The Graduate Profile	Description
1. Research assistants in the fields of biology and the environment	A professional whose job is to assist research work in the biological and environmental fields under the supervision of senior staff
2. Quality control staff	A professional that is responsible for controlling food quality so that product quality meets standards or controls the quality of industrial waste to meet quality standards.
3. Bio-entrepreneur	Entrepreneurs who work on tropical biological resource processing whose products are marketable, so they can earn profits.

Programme Learning Outcomes (PLOs)

Programme Learning Outcomes (PLOs) of Bachelor in Biology at the University of Jember are prepared by referring to the Indonesian National Qualification Framework 6th level. The Indonesian National Qualification Framework 6th level includes:

1. able to apply their field of expertise and utilize knowledge, technology, and/or art in their field in solving problems and being able to adapt to the situation at hand
2. mastering the theoretical concepts of a particular field of knowledge in general and concepts theoretical part of a special section in the field of knowledge in-depth, as well as being able to formulate procedural problem solving
3. able to make the right decisions based on information and data analysis and to provide guidance in choosing various alternative solutions independently and in groups
4. responsible for their work and can be given responsibility for the achievement of organizational work.



Furthermore, every graduate of Bachelor in Biology achieved the learning outcomes referred to Subject-Specific Criteria of the Technical Committee (SSC) 10-ASIIN as listed below (Table 2).



Table 2. PLOs and Indicators

Code	PLOs	Code	Indicator
Attitude			
PLO1	able to internalize norms and ethics based on Pancasila in working independently or in groups	1.a	showing an honest attitude and responsibility as the practice of Pancasila
		1.b	working individually or in team works
Knowledge			
PLO2	able to analyse the principles of biology, mathematics, and other relevant natural sciences	2.a	analyzing the basic concepts of biology, mathematics, other relevant natural sciences
		2.b	correlating the basic concepts of science (physics, chemistry, mathematics) with the principles of biology
PLO3	Able to analyse the principles of molecular biology, cells, organisms and management of tropical biological resources.	3.a	Describing the principles of molecular biology, cells and organisms
		3.b	analysing biological principles that are relevant to the problem of biological resources management in tropics
General skills			
PLO4	able to implement scientific methods for the biological resources management and commercial products development in tropics	4.a	implementing scientific methods for the management of biological resources in tropics
		4.b	demonstrating scientific methods for development of commercial products from the tropical natural resources
PLO5	able to implement the logic of critical thinking on biosafety and environmental issues related to the field of biology with a scientific and bioethical approach	5.a	implementing the logic of critical thinking on biosafety related to the field of biology with a bioethics approach for better environmental awareness



		5.b	using the logic of critical thinking on environmental issues related to the field of biology with a scientific and bioethics approach
Special skills			
PLO6	Able to do laboratory work and/or in the field independently and/or in groups for biological concepts implement	6.a	practising laboratory and/or field works independently and in groups
		6.b	using software applications and/or basic instruments for sampling and analysis in biology and environmental fields
PLO7	able to employ bioscience in solving problems related to biological resources in tropics and to communicate the results.	7.a	integrating bioscience in problems solving related to the management of biological resources in tropics
		7.b	presenting the results of problems solving related to the management of biological resources in tropics



Curriculum Structure and Distribution Curriculum Structure

The curriculum structure of Bachelor in Biology is provided in Table 7.

**Table 7. Curriculum structure of Bachelor in Biology
Permendikbud RI No. 154 Tahun 2014**

Code	Type of Modules	Credits/%	ECTS
MAU, UNU, MPK	General Compulsory Courses	32 (22.22)	48.32
MAB	Specific Compulsory Courses	77 (53.47)	113.25
MAB	Elective Courses	29 (20.14)	46.81
MAU	Final Project	6 (4.17)	9.06
Total Credit		144 (100.00)	cc

Module distribution

Module distribution of Bachelor in Biology is provided in Table 8.

Table 8. Course distribution of Bachelor in Biology

No	Code	Module	Credit				Prerequisite
			Theory	Practice	Total credit	ECTS	
1st Semester							
1	MAU 1101	Calculus	3	1	4	6.04	
2	MAU 1102	General Physics	3	1	4	6.04	
3	MAU 1103	Basic Chemistry	3	1	4	6.04	
4	MAU 1104	Fundamental Biology	3	1	4	6.04	
5	MPK 9001 MPK 9002 MPK 9003 MPK 9004 MPK 9005	Education Islamic Christian Catholic Hindu Buddhism	2	0	2	3.02	



6	MAU 1105	English	2	0	2	3.02	
Total credit of 1st semester					20	30.2	
2nd Semester							
1	MPK 9001	Indonesian	2	0	2	3.02	
2	MAB 1201	Microbiology	2	1	3	4.53	MAU 1104
3	MAB 1202	Plant Structure	3	1	4	6.04	MAU 1104
4	MAB 1203	Animal Structure	3	1	4	6.04	MAU 1104
5	MAB 1205	Cell Biology	2	0	2	3.02	MAU 1104
6	MAB 1206	Biochemistry	2	1	3	4.53	MAU 1103, MAU 1104
7	MPK 9006	Civic Education	2	0	2	3.02	
Total credit of 2nd semester					20	30.2	
3rd semester							
1	UNU 9001	Pancasila Education	2	0	2	3.02	
2	MAU 1009	Introduction to Environmental Science	2	0	2	3.02	
3	MAB 1301	Microbial Physiology	2	1	3	4.53	MAB 1201
4	MAB 1302	Plant Development	2	1	3	4.53	MAB 1202
5	MAB 1303	Animal Development	2	1	3	4.53	MAB 1203
6	MAB 1304	Terrestrial Ecology	2	1	3	4.53	MAU 1104
7	MAB 1406	Genetics	3	1	4	6.04	MAU 1104
8	MAB 1504	Biostatistics	2	0	2	3.02	MAU 1101, MAU 1104
9	MAB 1307	Bioethics	2	0	2	3.02	
Total credit of 3rd semester					24	27.6	



4 th semester							
1	MAB 1306	Molecular Biology	3	1	4	6.04	MAB 1206
2	MAB 1402	Plant Systematic	3	1	4	6.04	MAB 1202
3	MAB 1403	Animal Systematic	3	1	4	6.04	MAB 1203
4	MAB 1404	Aquatic Ecology	2	1	3	4.53	MAB 1304
6	MAB 1506	Bioinformatics	1	1	2	3.02	MAU 1101, MAB 1206,
6	MAB 1601	Microtechnique	1	1	2	3.02	MAU 1104
7	MAB 1603	Evolution	3	0	3	4.53	MAB 1406
8	MAB 1605	Biology Conservation	2	0	2	3.02	MAB 1304
Total credit of 4th semester					24	27.6	
5 th semester							
1	MAU 1007	Introduction to Entrepreneurship	2	0	2	3.02	
2	MAU 1010	Occupational Safety and Health	2	0	2	3.02	MAU 1102, MAU 1103, MAU 1104
3	MAB 1502	Plant Physiology	3	1	4	6.04	MAB 1202
4	MAB 1503	Animal Physiology	3	1	4	6.04	MAB 1203
5	MAB 1505	Environmental Science	1	1	2	3.02	MAU 1105
6	MAB 1522	Tissue Culture	1	1	2	3.02	MAB 1302, MAB 1303
7	MAB 1605	Biology Conservation	2	0	2	3.02	MAB 1304
8		Elective Courses*			8	12.08	Please see Table 8
Total credit of 5th semester					24	27.6	
6 th semester							



1	MAB 1006	Research Methodology	2	0	2	3.02	MAB 1504
2		Elective Courses*			21	31.71	Please see Table 8
Total credit of 6th semester					23	18.27	
7th semester							
1	MAU 1008	Community Services Training	0	3	3	4.53	Minimum total credit \geq 110
Total credit of 7th semester					3	4.53	
8th semester							
1	MAU 1811	Final Project	0	6	6	9.06	GPA \geq 2; Minimum total credit \geq 120; have passed Community Services Training
Total credit of 8th semester					6	9.06	
Total credit					144	217.44	

* Distribution of the elective courses is shown in Table 9.



The Elective course distribution of Bachelor in Biology based on research group is provided in Table 9.

Table 9. Elective course distribution of Bachelor in Biology based on research group (starting at 5th semester)

No	Code	Module	Semester	Theory	Practice	Total credit	ECTS	Prerequisite
A. Microbiology Research Group Courses								
1	MAB 1401	Mycology	even	1	1	2	3.02	MAB 1201
2	MAB 1507	Food Microbiology	odd	1	1	2	3.02	MAB 1301
3	MAB 1508	Health Microbiology	odd	1	1	2	3.02	MAB 1301
4	MAB 1524	Enzymology	odd	1	1	2	3.02	MAB 1301
5	MAB 1607	Industrial Microbiology	even	1	1	2	3.02	MAB 1301
6	MAB 1608	Virology	even	2	0	2	3.02	MAB 1201
7	MAB 1609	Microbiological Analysis Techniques	even	1	1	2	3.02	MAB 1301
8	MAB 1610	Bioconversion	even	2	0	2	3.02	MAB 1301
B. Botany Research Group Courses								
1	MAB 1510	Ethnobotany	odd	1	1	2	3.02	MAB 1402
2	MAB 1511	Ornamental Plant	odd	1	1	2	3.02	MAB 1402
3	MAB 1513	Bryology	odd	1	1	2	3.02	MAB 1402
4	MAB 1523	Natural Medicine	odd	2	0	2	3.02	MAB 1206
5	MAB 1611	Phytohormone	even	1	1	2	3.02	MAB 1502
6	MAB 1612	Plant Ecophysiology	even	1	1	2	3.02	MAB 1304, MAB 1502
7	MAB 1613	Orchidology	even	2	0	2	3.02	MAB 1402
C. Zoology Research Group Courses								
1	MAB 1514	Animals Reproduction	odd	1	1	2	3.02	MAB 1303



2	MAB 1515	Parasitology	odd	1	1	2	3.02	MAB 1403
3	MAB 1516	Animal Behaviour	odd	1	1	2	3.02	MAB 1403
4	MAB 1614	Entomology	even	1	1	2	3.02	MAB 1403
5	MAB 1615	Endocrinology	even	2	0	2	3.02	MAB 1503
6	MAB 1616	Immunology	even	1	1	2	3.02	MAU 1104
7	MAB 1617	Human Physiology	even	1	1	2	3.02	MAB 1503
D. Ecology Research Group Courses								
1	MAB 1501	Biogeography	odd	2	0	2	3.02	MAU 1104
2	MAB 1517	Ecotourism	odd	2	0	2	3.02	MAB 1304, MAB 1404
3	MAB 1518	Valuation of Biological resources	odd	1	1	2	3.02	MAB 1304, MAB 1404
4	MAB 1519	Environmental Biomonitoring	odd	1	1	2	3.02	MAB 1505
5	MAB 1602	Tropical Forest Ecology	even	2	0	2	3.02	MAB 1304
6	MAB 1604	Mangrove Ecology	even	2	0	2	3.02	MAB 1404
7	MAB 1619	Bio-invasion Ecology	even	2	0	2	3.02	MAB 1304, MAB 1404
8	MAB 1620	Phytoremediation	even	1	1	2	3.02	MAB 1505
9	MAB 1621	Coastal Area Management	even	2	0	2	3.02	MAB 1404
10	MAB 1627	Wildlife management	even	2	0	2	3.02	MAB 1304
E. Biotechnology Research Group Courses								
1	MAB 1520	Forensic Biology	odd	2	0	2	3.02	MAB 1206
2	MAB 1521	Industrial Biotechnology	odd	2	0	2	3.02	MAB 1306
3	MAB 1622	Plant Biotechnology	even	2	1	3	4.53	MAB 1306
4	MAB 1623	Health Biotechnology	even	2	1	3	4.53	MAB 1306



5	MAB 1624	Molecular Genetics	even	2	0	2	3.02	MAB 1306
6	MAB 1625	Population Genetics	even	2	0	2	3.02	MAB 1406



Lecturers

Name	Employ ID Number	Position
Prof. Dr. Bambang Sugiharto, M.AgrSc.	195510221982121001	Guru Besar
Dra. Mahriani, M.Si.	195703151987022001	Lektor Kepala
Dr. Hidayat Teguh Wiyono, M.Pd.	195805281988021002	Lektor
Dra. Susantin Fajariyah, M.Si.	196411051989022001	Lektor Kepala
Drs. Rudju Winarsa, M.Kes.	196008161989021001	Lektor
Dr. Rike Oktarianti, M.Si.	196310261990022001	Lektor Kepala
Dra. Hari Sulistiyowati, M.Sc., Ph.D.	196501081990032002	Lektor Kepala
Dra. Dwi Setyati, M.Si.	196404171991032001	Lektor
Dr. Sutoyo, M.Si.	196610141992031002	Lektor
Dr. Retno Wimbaningrum, M.Si.	196605171993022001	Lektor
Drs. Siswanto, M.Si.	196012161993021001	Lektor
Dr. Asmoro Lelono, M.Si.	196810151998021001	Lektor
Dr. Sattya Arimurti, SP., M.Si.	197403311999032001	Lektor Kepala
Dr. Esti Utarti, SP., M.Si.	197003031999032001	Lektor
Purwatiningsih, S.Si., M.Si., Ph.D.	197505052000032001	Lektor
Eva Tyas Utami, S.Si., M.Si.	197306012000032001	Lektor
Dr. rer.nat. Kartika Senjarini, S.Si., M.Si.	197509132000032001	Lektor Kepala
Dr. Kahar Muzakhar, S.Si.	196805031994011001	Lektor Kepala
Rendy Setiawan, S.Si., M.Si.	198806272015041000	Asisten Ahli
Dr. rer.nat. Fuad Bahrul Ulum, S.Si., M.Sc.	198409262008121000	Asisten Ahli
Syubbanul Wathon, S.Si., M.Si.	199009062019031014	Asisten Ahli
Mukhamad Su'udi, Ph.D	760016788	Tenaga Pengajar
Arif Mohammad Siddiq S.Si., M.Si.	199111012022031004	Tenaga Pengajar



Biology Alumni

The Biology S1 Study Program already has an alumni association who joins a group on Facebook (ALUMNI FMIPA BIO UNEJ) which consists of around 300 alumni. Activities that take place in this group include sharing job vacancies, sharing scholarships for study/college, sharing alumni work experiences, and *sharing* college experiences for alumni who are continuing their studies.

The participation of alumni in supporting the academic development of study programs in the form of:

1. Fund donations, alumni who have just graduated donate Rp. 25,000 for the purchase of reference books.
2. Donations of facilities, participation of alumni in supporting academic development in the form of purchasing identification books/ *text books* , donations of laboratory equipment in the form of metabolic cages for the maintenance of test animals and laboratory equipment.
3. Involvement in academic activities, alumni participation in international seminars, as resource persons, curriculum review, and resource persons to improve the quality of research in each field of science.
4. Network development, facilitating *sharing* job vacancy information with students.
5. Provision of facilities for academic activities, alumni facilitate the provision of student research places

The participation of graduates and alumni in supporting the non-academic development of study programs in the form of:

1. Funding contributions, alumni make regular donations of Rp. 10,000 per month which are paid at alumni meetings for the development of HMJ and alumni activities.
2. Donations of facilities, alumni donate in the provision of air conditioning in the thesis examination room, wall clocks, and specimen cabinets in the laboratory room, computers.
3. Involvement in non-academic activities, biennial reunions, social activities, joint sports.
4. Network development, alumni joined in each region or alumni coordinator, alumni forum with study programs for social activities and career development.
5. Provision of facilities for non-academic activities, providing places for social service activities, transportation and accommodation for social service activities in humanitarian aid activities.

