ACADEMIC HANDBOOK

Master's Program in Biomedical Sciences

Academic Year 2013/2014

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PREFACE

The Academic Handbook of the Master's Program in Biomedical Sciences of the Postgraduate Program of Faculty of Medicine University of Brawijaya (FMUB) Year 2013/2014 was published in order to disseminate information on matters which relate to the implementation of the learning process in the Master's Program in Biomedical Sciences Postgraduate ProgramFMUB.

This handbook is constructed based on the Education Guideline of University of Brawijaya 2012/2013, the handbook Master's Program in Biomedical Sciences of the Postgraduate Program FMUB Year 2011/2012 and Academic Guidances of Master Program UB 2012 to achieve a harmony with the current academic and the stake holders (users of the graduates) needs and the development of Medical Science and Technology.

Finally, this book is projected to be the basis of the implementation of teaching and learning process and provide a clearer description to the management, students, faculty members, and society regarding the implementation of the program.

Faculty of Medicine, University of Brawijaya
Dean,

signed

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(DEAN DECREE NO. 1698/ST/UN10.7/KP/2013)

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CHAPTER 1

INTRODUCTION

A. History of the Master's Program in Biomedical Sciences

The Postgraduate Program of Faculty of Medicine University of Brawijaya (FMUB) originated from the establishment of Postgraduate Program of University of Brawijaya (PPUB) which was started in 1981. The pilot program began with cooperation between University of Brawijaya and Gajah Mada University to hold Credit Collection Program UGM-UNIBRAW. The program aimed to help University of Brawijaya in planning and implementing education at Postgraduate level independently. After eleven years with the status of KPK UGM-UNIBRAW program, based on the Decree of Director General of Higher Education No.104/Dikti/Kep/93, 105/Dikti/Kep/93, 106/Dikti/Kep/93 the Postgraduate Program of University of Brawijaya conduct its activities independently on February 27th, 1993 with three Master's Programs (Stratum 2 or Magister).

With the surging growth of study programs in the Postgraduate Program of University of Brawijaya, coupled with an increasing number of applicants aspiring for new study programs, since the academic year of 1995/1996 PPUB has administered seven Master's programs (Stratum 2 or Magister). Starting from the academic year of 1998/1999 PPUB has administered 12 Masters programs and one doctoral Program (S3), that is Agricultural Sciences, which includes Master's Program in Biomedical Sciences (Decree of the Director General of Higher Education 326/DIKTI/KEP/1998 dated 14 September 1998).

Based on the Rector's decree no. 30/SK/2006 and Rector's Circular Letter 2012/J10/LL/2006 that stipulate every Master's and Doctoral progam is to be under its perspective faculty, since the even semester of the academic year 2008/2009, the Master's Program in Biomedical Sciences has been under the

Faculty of Medicine and based on the Decree of the Director General of Higher Education No. 2374/D/T/K-N/2010, this program has acquired authorization which due in 2013.

B. Development of the Academic Field

In the academic year of 1998/1999 based on the Decree of the Director General of Higher Education of the Ministry of Education and Culture No. 326/DIKTI/Kep/1998 dated 14 September 1998 signed by Director General of Higher Education, the Master's Program in Biomedical Sciences was opened as Education program of Stratum 2 (S2) at the Postgraduate Program of University of Brawijaya and it was constituted to have six concentration: Medical Pharmacology, Medical Toxicology, Medical Anatomy-Histology, Medical Parasiology, Medical Microbiology, and Medical Immunology. Considering the development of potential research in the area of Biomolecular, the increase of the number of lecturers with the title of Professor and Doctorate of both national and overseas graduates, the tendency of the needs articulated by the candidates of this program, and the patterns of diseases, in 2009 the concentrations of Preventive Medicine, Clinical Medicine and Molecular Physiology were opened. This makes this program holds nine concentrations (Dean's Decree No.071/SK/UN10.7/KP/2011).

Based on the Curriculum Standard of Medical Specialist, which aims at improving the quality of specialist program, and the objectives of the Faculty of Medicine, University of Brawijaya to develop human resources of researcher in the area of health and medicine, the Master's Program in Biomedical Sciences started pioneering the implementation of a double degree involving the Master's Program in Biomedical Sciences with specialist program/clinical profession simultaneously. Its graduates are expected, in the future, to contribute to the

development of health and medical sciences in the field of Biomedical Sciences, so that they will be able to catch up in the field of medicine and health sciences. This leads to the commencement of the double degree program for Master in Biomedical Sciences and Pediatric Specialist (SpA) (Dean's Decree No.19A/SK/H10.7/AK/2011) starting from 2008/2009 under a cooperation with Pediatric Specialist Program of FMUB/dr. Saiful Anwar Hospital Malang. Later in this program develops further with Neurologist Specialist Program and Clinical Pathology Specialist Program.

By considering the fact that the graduates of Medical Study Program (Bachelor of Medicine) at FMUB have considerable human resource potentials in the area of education and research, since 2010/2011 academic year, in collaboration with the Medical Study Program FMUB, the double degree program for Master of Biomedical Sciences and Medical Doctor has been conducted (Dean's Decree No.19A/SK/H10.7/AK/2011).

In addition to support the university's vision and mission of becoming World Class University (WCU), since the 2009/2010 academic year, through a double degree program in the university, the double degree program with Pintung University has been opened. Master's Program in Biomedical Sciences has also opened for the admission of overseas students under the UB regulation trough International Office of UB.

C. Vision, Mission, Target and Objective of the Program

The Master's Program in Biomedical Sciences bears vision and missions adjusted to the vision and mission of UB and FMUB.

The Vision of UB is

“Becoming an excellent university with international standard and capacity to play active roles in the national development through the process of education, research, and community service”

The vision is elaborated into the missions of UB below:

1. Implementing the education process to achieve quality human resources, obedient to God, possessing the spirit of entrepreneur, knowledgeable, having discipline and good work ethic to become academic resource and professional with integrity and capable of competing in international level,
2. Developing science, technology, and art to support the national development,
3. Having the ability empowering society in the development through the application of current science and technology.

Based on the vision of UB, FMUB states its vision:

“Becoming a leading world-class institution of medical and health sciences education”

The mission of FMUB is:

“Pioneering education, research, and community development using quality and current medical and health sciences”

Vision, Mission, Target and Objectives of the Master’s Program in Biomedical Sciences

Vision

"The Master's Program in Biomedical Sciences Postgraduate Program FMUB as the centre of study on biomedical sciences and master's education possessing international competitive power with superiority in the fields of Pharmacology, Toxicology, Anatomy-Histology, Microbiology, Parasitology, Immunology, Molecular Physiology, Preventative Medicine, and Clinical Medicine.

Mission

"Pioneering in current and high quality education and research in the Medical Sciences with the Biomedical Study related with patho-mechanism of disease and medical technology the result of which is to increase the health level of the society".

Target

The target of this study program is to produce qualified graduates on time in accordance with their competence. All graduates are expected to have a career in the field of education and research related to biomedical sciences and be able to develop themselves in this profession. It is expected that the program in Master's in Biomedical Sciences Postgraduate Program FMUB is able to develop into the center of biomedical education and research which has implemented quality management according to 7 quality standard of BAN-PT and ISO 9001. 2008. Thus it will place the Study Program in the rank of leading institutions nationally and internationally.

The Aim

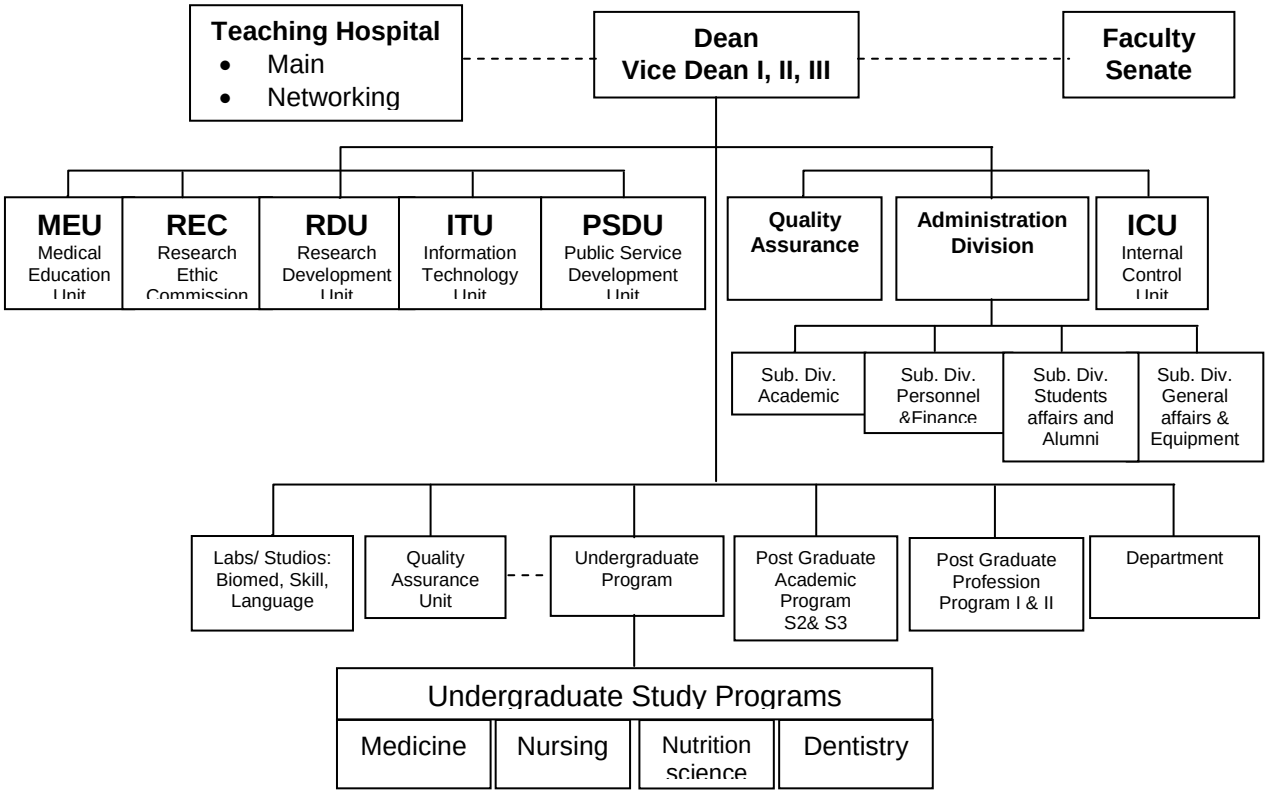
The implementation of professional educational program and learning activities, by creating a conducive atmosphere to enhance the intellectual capacity of the learners.

1. Produce graduates who “have very noble moral value, have the potentiality to apply and develop biomedical sciences in accordance with his interest and specialty and are able to carry out a valid and innovative laboratory/research works in the cellular and molecular levels”
2. Produce graduates with the supporting competencies “having the ability to develop research related to studies on: Metabolic-Degenerative, Herbal, Stem cells, Autoimmune, growth and development, and Infections by using instrumentation and technology on molecular analysis in according with his interest and specialty”.
3. The increase of quality in research on the studies on Atherosclerosis, Herbal, Stem cell, Auto immune, Free Radical, Endocrine-Metabolic, growth and development and Infections; thus they can be published internationally.

D. Organizational Structure of FMUB

In line with the mission, to manage the study program professionally, an organizational structure of FMUB is established in accordance with the decree 079/SK/J10.1.17/KP/2007.

Organizational Structure
Faculty of Medicine, University of Brawijaya
(Decree of Faculty Senate No. 079.SK/J10.1.1.7/KP/2007)

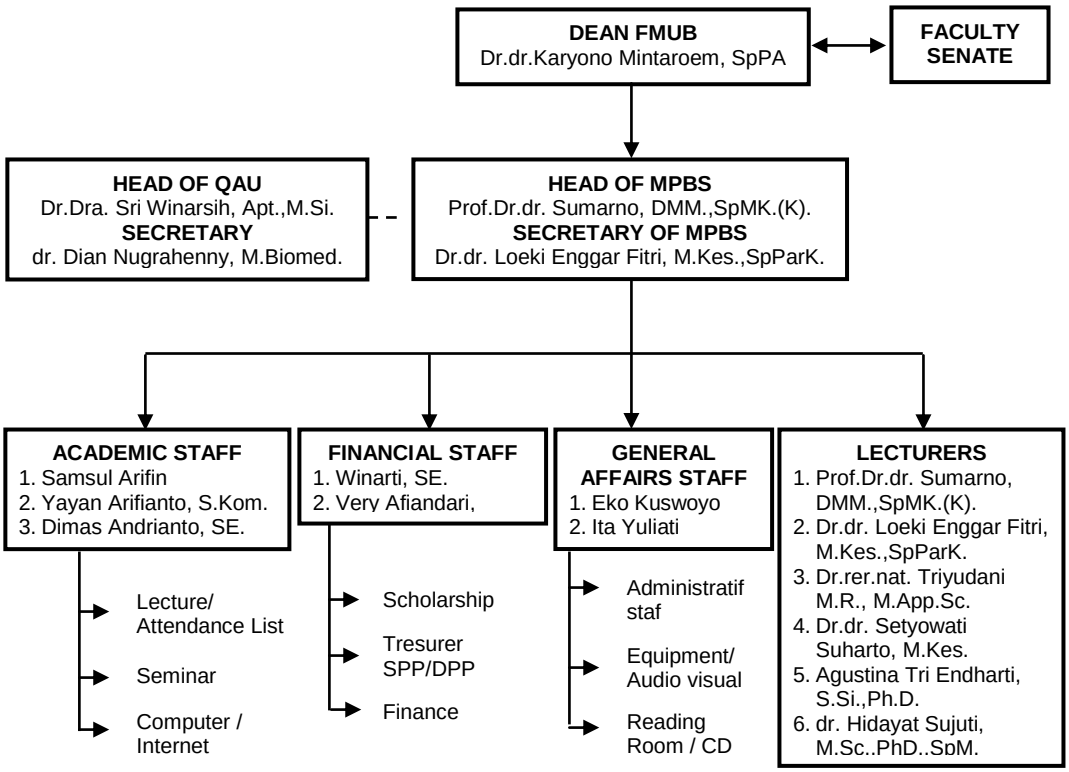


E. Internal Organization of the Management

In line with the mission, to manage the study program professionally, an internal organization structure of the managers of Master's in Biomedical Sciences Postgraduate Program FMUB is established.

Internal Organization of Master's Program in Biomedical Sciences (MPBS) Postgraduate Program FMUB

(Decree of Dean No. 178/SK/UN10.7/KP/2013)



CHAPTER 2

GENERAL PROVISIONS

A. Student Admission System

Student admission in Master's Program in Biomedical Sciences FMUB covers; (1) academic requirements, (2) completion of administrative requirements, (3) capacity of the study program.

B. Academic Requirements for Master's Program in Biomedical Sciences

1. Candidates should hold a bachelor (undergraduate degree) certificate on *bio-complex* sciences (bachelor in medicine and/or medical doctor, dentistry, veterinary, pharmacy, nursing, biology and other related fields).
2. Candidates must have a GPA of ≥ 3 (on 0 to 4 scale) from BAN-PT accredited study program.
3. Candidates must hold scholastic test (TPA-OTO BAPPENAS) certificate and English proficiency certificate equal to TOEFL score of 500, have produced academic scientific writings and pass a psychology test or an interview conducted by the study program.
4. All candidates meeting both academic and administration requirements must pass matriculation program

C. Admission Requirements for International Student

International students applying an admission to Master's Program in Biomedical Sciences must;

1. Hold a bachelor (undergraduate) certificate or equivalent which are legalized by Indonesian Embassy in their home countries as well as Indonesian Ministry of National Education and Culture

2. Obtain a study permit from Directorate of Higher Education at the Ministry of National Education and Culture
3. Have a TOEFL score of ≥ 500
4. Have a course certificate in Indonesian language
5. Pass academic selection held by the program

D. Admission Requirements for Transfer Program

1. Candidates are graduates of state or private university of equal or higher accreditation status
2. Candidates are from study programs of the same field of study with biomedical sciences
3. Candidates have not taken thesis proposal examination and have been studied in the origin institution for no more than 2 years

E. Application Procedure for Master's program

1. Candidates send a written application and complete an application form addressed to:

The Dean of Faculty of Medicine University of Brawijaya

Jl. Veteran Malang 65145

Telephone. 0341-569117 Fax 0341-564755

2. Enclosed in the application are three copies of;

a. Legalized bachelor (undergraduate) certificate
b. Legalized academic transcript from institution of origin; candidates from private universities must enclose the result of state examination.
c. Two letters of recommendation from qualified referee.
d. Academic scientific writing after completing bachelor (undergraduate) program (for certain candidates only)

e. Curriculum Vitae

f. Statement of health from a state hospital

g. Letter of Study Appointment from superiors (if the candidates are in employment) stating that the concerned individual is release of any institutional responsibility. For candidates who are lecturers of state and private universities, the letter of Study Appointment is to be issued by the rector of university of origin. For candidates who are the employees of Health Department, the letter of Study Appointment is to be issued by the candidate's immediate superior e g., head of hospital or head of Health Department

h. Newest photograph sized 4 x 6 (4 copies)

i. Statement of financial sources/support

j. Scholastic test (TPA-OTO BAPPENAS) and TOEFL (or TOEFL equivalent) certificate

k. Identity Card. For international student, KITAS from Immigration Office of East Java Province

3. Time of Application

Application for odd semester intake commences from the beginning of February to the end of May, while even semester intake commences from the beginning of October to the end of December.

4. Candidate Selection/Criteria of admission

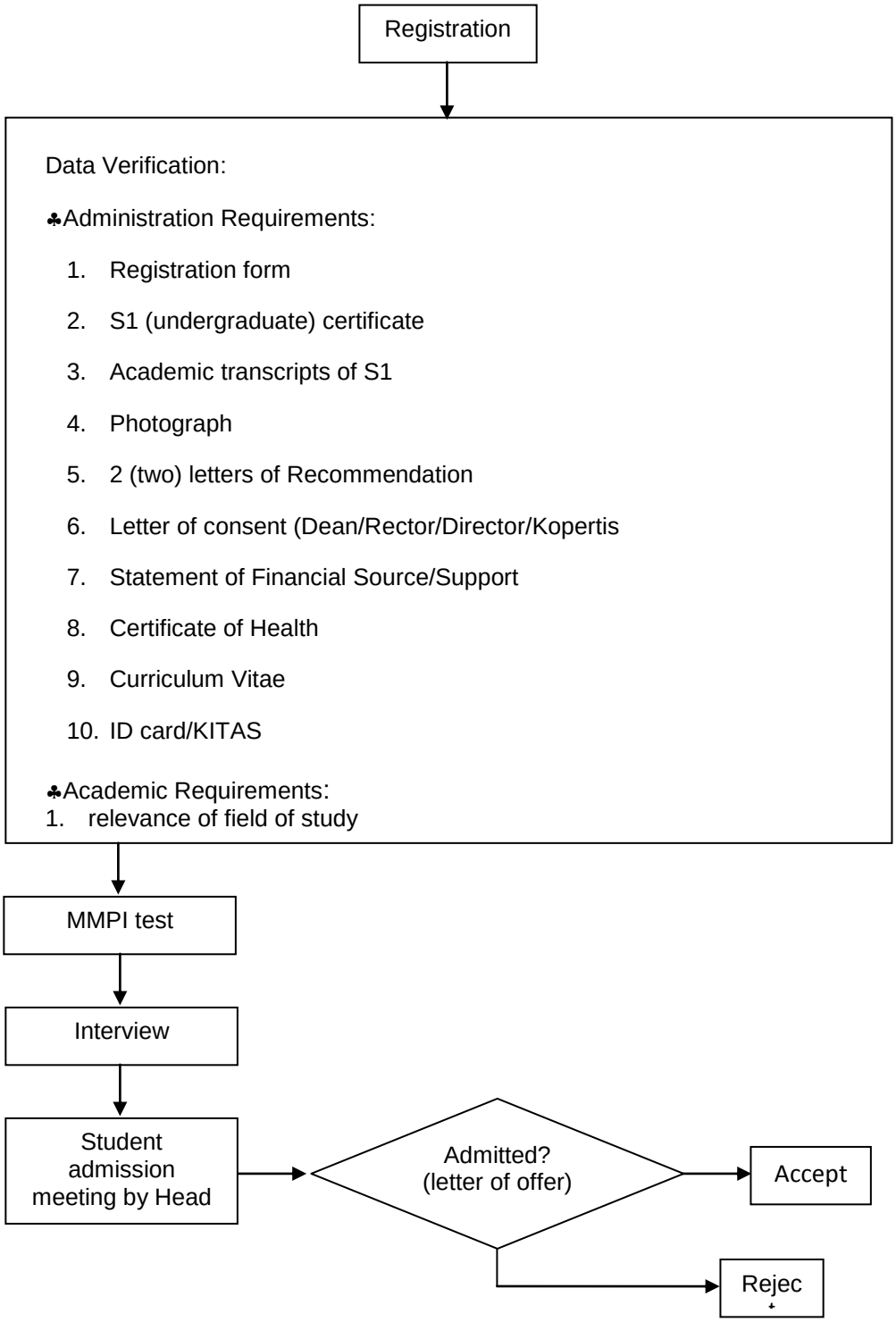
Candidate selection is done through psychology test and/or interview involving peer group consisting of the head of study program, the secretary of study program, and experts recommended by the head of study program. The decision on accepted candidate is made by the rector through the dean based on the recommendation of the head of study program. Letter of offer and letter of rejection are sent to the applicant's

address. All candidates granted admission to the Study Program of Master in Biomedical Sciences, Faculty of Medicine University of Brawijaya must pass the matriculation program.

FLOW CHART OF THE STUDENT ADMISSION PROCESS

MASTER PROGRAM IN BIOMEDICAL SCIENCES

POSTGRADUATE PROGRAM FMUB



CHAPTER 3

EDUCATION SYSTEM OF

MASTER'S PROGRAM IN BIOMEDICAL SCIENCES

A. The Implementation of Semester Credit System

The implementation of teaching and learning process is done by using semester credit system in the form of lecture and/or laboratory work and research

Lecture; one credit unit per semester is equals to 50 minutes classroom meeting, 60 minutes structured study, and 60 minutes independent study per week

Laboratory work; one credit unit per semester is equal to 2 hours of laboratory work, 1-2 hours of structured study, and 1-2 hours of independent study per semester (equals to 18 week of working hours)

Research; one credit unit is equals to 3-4 hours of conducting research per month, in which a month is equals to 25 working days

B. Academic Registration

The students of Master's Program in Biomedical Sciences are those who are administratively enrolled to the program on a particular semester. Those who do not register is automatically suspended. Registration at the beginning of every semester is compulsory. The registration is done in academic division of Post Graduate Program of FMUB.

Students in the process of registration should come in person to;

a. Complete registration form and course plan record (KRS)
b. Show the tuition fee receipt and submit a copy of the receipt along with the form
c. Submit 4 copies of photograph size 3 x 3

d. Meet other registration requirements determined by the Master's Program in Biomedical Sciences, FMUB.
e. Submit a copy of academic achievement record.

C. Academic Staff

Academic staff consists of lecturers, thesis advisors and thesis examiners. Lecturers who are eligible to teach in the Master's Program in Biomedical Sciences are those with doctorate degree (Ph.D).

a. Thesis Advisor Committee

Thesis advisor committee consists of academic staffs who are responsible for thesis advisory. Every student is advised by two academic staff at minimum and three academic staff at maximum, one of which is the chairman of the committee; the other(s) is/are member(s) of the committee. The chairman of the committee is a permanent academic staff of University of Brawijaya with a doctorate degree (Ph.D) who hold the academic rank of *lector* at minimum. The member(s) of the committee must have a doctorate degree (academic rank is not considered). Thesis advisor committee for double degree with medical specialist program can be non-permanent academic staff who hold consultant specialist (K) degree at minimum.

b. The Responsibility of Thesis Advisor Committee

The committee is responsible for (a) giving advice on research topic (b) guiding the planning and the implementation of the research and the writing of journal article and thesis (c) evaluating thesis proposal seminar, research implementation, research result seminar, thesis writing and examination (d) attending thesis proposal seminar, research result seminar, thesis examination of the advisee (e) regulating the process of the research and time management of

the research so that the research can be completed within the time limit provided by the program (f) the publication of the research result of the advisee.

c. The Procedure of Thesis Advisor Committee Appointment

At the end of semester 2, the committee should have been appointed. The procedure is as follow;

1. A student proposes 2 academic staffs as thesis advisors to the head of the program; one as the chairman of the committee and the other as the member of the committee. The proposal is made at the end of semester 2.
2. Based on the proposal, the head and the secretary of the program hold a coordination meeting to appoint thesis advisors. Based on certain objective consideration, the appointed advisors may or may not be in line with the student's proposal.
3. The result of the meeting is consulted to the dean of FMUB for consideration and decision.
4. The dean issues a decree of thesis advisor committee appointment based on the result of the meeting.

d. Changes in Thesis Advisor Committee

When, for a certain reason, there is a change in the thesis advisor committee, the concerned advisee must propose a new thesis advisor committee by completing the form for thesis advisor committee change and submitting the form to the head of the program. The head of the program consults the dean of FMUB for consideration and decision. The changing in the thesis advisor committee is made on one or more of the following reason; (1) changing in thesis title/topic (2) disagreement on key points of the research between advisor and the advisee (3) communication barrier impending the consultation process (4)

study time limit (5) a breach in ethical/moral/social code or intimidation (6) the advisor cannot continue the process of advisory due to a newly held position.

e. Thesis Examiners

The examiners are academic staffs who hold, at least, a doctorate degree or a specialist consultant. The examiners are responsible for the evaluation of the thesis manuscript. Every student will be evaluated by two examiners (at minimum) or three examiners (at maximum). Examiners may be a member of University of Brawijaya academic staff or of other universities/institution (external examiner). Every student is entitled to 1 external examiner only. The accommodation and transportation cost of external examiner is at the expense of the concerned student.

f. The Responsibility of Thesis Examiner

Thesis examiners are responsible for (a) evaluating thesis proposal seminar, research result seminar, and thesis examination (b) attending thesis proposal seminar, research result seminar, and thesis examination.

g. The Procedure of Forming Thesis Examiners Committee

At the end of semester 2, thesis examiners should have been appointed. The procedure is as follow;

1. Based on the topic of student research (proposal), the head and the secretary of the program hold a coordination meeting to appoint the examiners.
2. The result of the meeting, made on objective considerations basis, is consulted to the dean of the Faculty of Medicine for consideration and decision.
3. The dean issues a decree of thesis advisor committee appointment based

on the result of the meeting.

h. Changes in Thesis Examiner Committee

When, for a certain reason, there is a change in the thesis examiner committee, the head and the secretary of the program hold a coordination meeting to appoint the new examiners.

D. Study Load

The number of credit units required to complete the master's program is 40 credit units at minimum consisting 28 credit units of lecture and laboratory work and 12 credit unit of thesis

Study load is compulsory academic activities consisting lecture, laboratory work, structured study, seminar, thesis. These activities must not exceed 24 credit units per semester. The subjects are classified into compulsory subjects, interest-compulsory subject, and elective subjects.

E. Number of Credit Units per Semester

i. The number of credit units in the first semester for students passing the matriculation program is 13 for regular class and 24 for double-degree class.

ii. The number of credit unit in the second, third, and so forth semester is based on the GPA of the previous semester;

GPA > 3.5 : up to 24 credit units

GPA ≥ 3.0 - < 3.5 : up to 21 credit units

GPA ≥ 2.75 - < 3.0 : up to 18 credit units

GPA < 2.75 : up to 15 credit units

F. Academic Achievement

Criteria and Grade

- Evaluating student's academic achievement uses the following criteria;
- The grading of the result of examination is done by each lecturer (or a team of lecturers) by using letters and numbers as the following;

value	*Letter*	*Number*	Ability Classification
>80 – 100	A	4	Very Good
>75 – 80	B+	3.5	Very Good – Good
> 69 – 75	B	3	Good
> 60 – 69	C+	2.5	Good – Fair
> 55 – 60	C	2	Fair
> 50 – 55	D+	1.5	Fair - Bad
> 44 – 50	D	1	Bad
0 – 44	E	0	Very Bad

- Final grade of a subject taught by a team of lectures is the average of grades from all lecturers. The coordinator of the team is responsible for compiling and computing the grades.
- The final grade for a subject is the combination of structured assignment and/or independent assignment, the result of mid-term test and final test. The final grade is determined using the above criteria.
- If a student fails to submit a structured and/or independent assignment, sit on a mid-term and final test of a certain subject, the final grade for the subject is K (stands for Score not available). The student must retake the subject later on.

a. Evaluation

a. Students who cannot obtain a GPA of 2.75 on their first semester for 8 credit units with the highest grades will be given a letter of warning for poor performance. The letter is intended that they improve their academic achievement in the following semester.

b. Students who fail to obtain a GPA of 2.75 on their second semester for 16 credit units with the highest grades will be pronounced failed in their study and not be allowed to continue their study in the program.
c. Subjects with “D” grades MUST be retaken, while those with “C” MAY be retaken. Subject retake can only be done once. The highest grade for a retake subject is B. Grade for a retake subject is taken on the value basis, not on the order of occurrence, meaning that the grade put in the academic transcript is the one with the higher value.
d. Students who have taken 24 credit units with a GPA of 3.00 and no “D” grade for any of the subjects, may propose a research for their thesis. **(UB Academic Rule of Master Program 2012).**
e. Research proposal has to be approved by the thesis advisor committee, defended and passed the examination conducted by a team of research proposal evaluation (thesis advisor committee and thesis examiners appointed by the dean of faculty of medicine)
f. Students passing the thesis proposal examination, completing all required revision, and having their thesis proposal approved by thesis advisor committee may commence their research.

G. Thesis Writing

Thesis is a final assignment for students of master’s program. It can be in the form of scientific writing which is written based on the result of research. Thesis is written in a way and format that must follow the established guidelines and under the supervision of thesis advisor committee. Thesis is equal to 12 credit units

The process of thesis writing consists of several stages; (a) thesis proposal writing (b) thesis proposal examination (c) ethical clearance review by

ethical clearance commission of FMUB (d) research implementation (e) journal article writing and thesis writing (f) research result seminar (seminar paper is written using the format of journal article) (g) feasibility study of the thesis manuscript.

1. **Thesis Proposal Writing**

Thesis proposal is a scientific writing containing research plan. This serves as the final assignment in the master's program of biomedical sciences. The writing of thesis proposal must follow the established guidelines. The proposal covers;

Introduction discusses the background of the study, the existence of phenomena worth researching, theoretical framework, the formulation of research problem, and objective of the research.

Review of Related Literature presents data and/or scientific information from various journals, journal articles, etc that are used to support or contradict the proposed research problem. This also includes inconclusive opinions on the problem being investigated. Based on the literature review, students analyze the problem to come up with a new concept to research.

Research Methodology covers methodology used by the researcher to approach the problem, sample selection, kinds of variables used in the research, how to measure, analyze, and test them, what instrument/devices or program to use, and how the result is presented. Information on place and time of the research, as well as other relevant information concerning the research is also presented in this chapter.

References contain a list of scientific publications that the researchers cite in the process of writing the proposal. References are written using number as demonstrated in the guideline of thesis and dissertation writing of

Postgraduate Program of FMUB.

2. Feasibility test of Thesis Proposal

Students may propose a feasibility test of their thesis proposal after they have taken 24 credit units with a GPA of ≥ 3.00 and no “D” grade on any subjects. The thesis proposal manuscript is submitted to the thesis advisor committee for approval. After being approved, the manuscript is ready for a feasibility test. The chairman of the thesis advisor committee sends a written proposal for the feasibility test to the head of the program.

The feasibility test is done by a forum led by the chairman of thesis advisor committee. If, for one reason or another, the chairman is unable to supervise the test, he/she can ask a member of the committee to take his/her place. The test can be administered if it is attended by the two thesis examiners and, at least, one thesis advisor. The test cannot be administered outside the test forum.

The test takes around 90 minutes and focuses on the student’s thesis proposal. The components of the evaluation are the thesis proposal manuscript, presentation, and student’s ability to argue scientifically. The test is attended by the chair or one of the members of the monitoring team and thesis evaluation in order to monitor the test administration and the required documentations.

Although the examiners determine what grade a certain examinee gets, the result of the test is decided by means of discussion. Passing grade for the test is “B” at minimum. If a student gets less than “B”, he/she is given the chance to repeat the test once. If he/she fail the test the second time, he/she has to revise his/her thesis proposal or is pronounced “fail” to complete study in the program.

Research proposal that has been approved by the thesis advisor

committee and passed the feasibility test, is legalized by the head of the program. Following the legalization of the proposal, the concerned student may conduct the research.

3. Research Implementation

A research is an academic program for student. This program can use an experimental or non-experimental design, the result of which will be used in writing the thesis.

A research can be conducted in other areas outside Malang or in any laboratories which serve the objective of the research and are approved by the advisor committee. Before commencing a research, a student has to complete all administration requirements in the academic division of graduate program of FMUB included ethical clearance review by ethical clearance commission of FMUB.

The research is under the supervision of the chairman of the thesis advisor committee or anyone who is appointed to represent the chairman. The result of the supervision is reported by the chairman of the committee to the head of the program or academic division. The result of the supervision is documented to be used as one of the considerations in the evaluation of the research. Students who have completed their research, is advised to immediately write a journal article for research result seminar and thesis manuscript. The research is documented in a *log-book* provided by the students themselves.

4. Journal Article and Thesis Manuscript Writing

Journal article is a scientific writing which is written based on a part or all result of the research. Journal article approved by thesis advisor committee is used as the material for research result seminar. Journal article is written in accordance with the established guideline of thesis and dissertation writing in

graduate programs FMUB.

Thesis manuscript is a scientific writing written based on the result of the research and in accordance with the established guideline of thesis and dissertation writing. Thesis manuscript is used as the material for thesis examination. Journal article is written based on the instructions of the designated journal. The selected journals are those which at least are nationally accredited. All supervisors must be responsible for the substance of the journal and have authority to be included as authors.

5. Research Result Seminar

Research result seminar is held by the Master's Program in Biomedical Sciences of FMUB and attended by thesis advisor committee, thesis examiners, students of graduate programs, and other interested parties who are intended to attend the research result seminar or who are purposefully invited by the panel to contribute constructive suggestion to improve the thesis manuscript. A student is allowed to hold a research result seminar if he/she has attended at least 10 research result seminars of relevant topic and has submitted the manuscript to accredited national and international journal.

Research result seminar is held on the recommendation of chairman of thesis advisor committee given to the head of the program. Then, the program processes the recommendation and invites the thesis examiners team. The invitation includes such information as time and place of the seminar and the journal article manuscript. The seminar can be held by more than one forum panel (three at maximum). The seminar is led by one of the students of the program.

Research result seminar is evaluated based on several criteria; journal article manuscript, presentation, and the student's ability to argue scientifically.

Material for the seminar is the thesis-advisor approved manuscript. The seminar produces journal article to be published in accredited national or international journals.

6. Feasibility Test of the Thesis Examination

A student whose thesis proposal has been approved by the advisor committee and who has conducted a research result seminar, and published a thesis-related article in a accredited national or international journal (at least a statement from the journal editor board that the article is in the process of publication is required) is eligible for a feasibility test on his/her thesis examination. **(UB Academic Rule of Master Program, 2012).**

Thesis examination is held on the recommendation of the chairman of thesis advisor committee given to the head of the program. Then, the program processes the recommendation and invites the thesis examiners team. The invitation includes such information as time and place of the seminar and the journal article manuscript.

The feasibility test is led by the chairman of thesis advisor committee. If, for one reason or another, the chairman is unable to supervise the test, he/she can ask a member of the committee to take his/her place. The test can be administered if it is attended by the two thesis examiners and, at least one thesis advisor. Examination is attended by the chair or one of the members of the monitoring team and thesis evaluation in order to monitor the examination administration and the required documentations. The test takes around 100 minutes. The material is the student's thesis manuscript. The test cannot be administered outside the test forum. Some of the evaluation components are thesis mastery and the ability to present and defend the thesis comprehensively.

The result of the test is determined by the examiners by means of a

discussion and is personally informed to the concerned student right after the test.

There are six evaluation components of the test with the following proportion; **(UB Academic Rule of Master Program, 2012).**

1. Thesis proposal 16.67 %
2. Research implementation 16.67 %
3. Thesis writing 16.67 %
4. Journal article writing 25 %
5. Research result seminar 8.33 %
6. Thesis examination 16.67 %

Evaluation on point number (ii) is done by thesis advisor committee, while point number (i), (iii) (iv) (v) and (vi) are done by thesis examiners. The grade is given in accordance to the established system (A, B+, B, C+, C, D+, and D). Final grade is the average of the total sum of the four points (based on the proportion). The passing grade for the feasibility test of thesis manuscript is “B” at minimum. If a student gets less than “B”, he/she is given the chance to repeat the test once. If he/she fail the test the second time, he/she has to revise his/her thesis proposal (with the thesis advisor’s consent) or is pronounced “fail” to complete study in the program.

Thesis manuscript revision, as suggested by the thesis examiners, must be completed within a month after the thesis examination. If a student fails to finish his/her thesis revision within the time limit and cannot provide a satisfactory explanation to the advisor committee, the chairman of the committee may propose that the concerned student repeat the thesis examination.

Students who pass the thesis feasibility test and complete the thesis revision (with the advisor’s approval) should make at least three copies of the thesis manuscript (for advisor committee, the program, and university). The

copies of thesis manuscript are legalized by being signed by the chairman of the thesis advisor committee and the dean of the faculty.

H. Passing Requirements

A student is declared to “PASS” the Master’s Program in Biomedical Science of Faculty of Medicine University of Brawijaya if he/she:

a. has taken 40 credit units (thesis included) with a GPA of ≥ 3,00 and no ”D” grade on any of those subjects
b. holds an English proficiency test certificate of TOEFL with a score at least 500 or other equivalent English proficiency tests, obtained from English Language Institution at University of Brawijaya or appointed institutions.
   has published a research article in a accredited national or international journal **(UB Academic Rule of Master Program, 2012).**
c. Students who has succesfully published research articles in more than 1 (one) accredited national or 1(one) international journals under a formal citation institution can pass the master’s program without taking final examination of thesis with an “A” grade on an approval from the publication team of the Study Program and University. (Decree of Rector No. 224/PER/2010).

Catatan : *Berdasarkan SK REKTOR Universitas Brawijaya No. 224/PER/2010 tentang Pedoman Pelaksanaan Tesis Sebagai Tugas Akhir Pendidikan Program Magister di Universitas Brawijaya, (1) mahasiswa* *wajib* ***menggunakan materi / substansi tesis untuk menyusun 1 (satu) artikel ilmiah yang diterima untuk diterbitkan dalam jurnal ilmiah nasional terakreditasi atau yang diakui Kementerian Pendidikan Nasional sebanyak 1 (satu) artikel dan mahasiswa tetap wajib menyusun tesis untuk dinilai oleh Dosen Penguji dalam suatu ujian akhir. (2) Apabila mahasiswa tidak dapat memenuhi ketentuan tersebut diatas, maka materi tesis sekurang-kurangnya harus diterima sebagai 1 (satu) makalah ilmiah untuk disajikan dalam seminar nasional dalam bidang ilmu yang sesuai dan mahasiswa tetap wajib menyusun tesis untuk dinilai oleh Majelis Dosen Penguji dalam suatu ujian akhir dengan nilai Tesis maksimal B+. (3) Apabila mahasiswa mencapai prestasi istimewa dengan menulis materi/substansi tesis menjadi 1 (satu) artikel yang diterima untuk diterbitkan menjadi*** *1* ***(satu) artikel dalam jurnal ilmiah internasional yang diakui Kementerian Pendidikan Nasional atau menjadi 2 (artikel) dalam jurnal ilmiah nasional terakreditasi maka mahasiswa tetap wajib menyusun tesis dan dinyatakan lulus tesis tanpa ujian dengan nilai A.***

I. Predicate of Graduates

Judicium is conducted after students complete all academic and administration requirements. The decision of whether a student has completed all of the requirement and can join the judicium is made in a pre-judicium meeting. A students declared “PASS” in the pre-judicium meeting gets a predicate of graduation as the following;

a. Pass with a cumlaude predicate if a student has a GPA of 3.75 – 4.0 with no “C” grade in any subjects, complete his/her study in five semesters at maximum, and get an “A” for his/her thesis and has published his/her research articles in an accredited national or international journal.
b. Pass with a “very satisfactory” predicate if a student has a GPA of 3.75 – 4.0 but does not meet the other criteria mentioned in article (a) or if a student has a GPA of 3.50 – 3.74. and has published his/her research articles in an accredited national or international journal.
c. Pass with a “satisfactory” predicate if a student has a GPA of 3.00 to 3.49 and has published his/her research articles in an accredited national or international journal.

J. Study Time Limit

Master’s Program in Biomedical Sciences is designed so that it can be completed in 4 semesters, even less. The time limit for completion is 8 semesters. Students who cannot complete their study in 8 semesters without any accountable reasons, will be pronounced failed to complete the program. Study time exclude academic leave (terminal). Each student is entitled to two semesters of academic leave during his/her study. In accordance with the dean‘s decree on the implementation and stipulation of double-degree program (the decree of the dean No. 19/SK/H.10.7/AK/2011, a students enrolled in double

degree class is entitled to four semesters of academic leave.

K. Academic Sanction

Violation of the academic regulations will be given academic sanction. Violations and the accompanying academic sanction are as follow;

a. Students who fail to attend 80 % of the meetings of a certain subject without any account table reasons are not allowed to join the final examination of the subject.
b. Students who drop a certain subject beyond the closing date for course cancellation, cannot have the subject removed from the course plan record, thus the subject is still included in the computation of their grade point.
c. Students who cheat in an examination will have their course plan record cancelled (or be given other kinds of academic sanction).
d. Students who sit on other students' examination or students who ask an impostor to sit on their examination will have all examinations for all subject that they take in that particular semester cancelled.
e. Students who alter their course plan records without the consent of their academic advisor will have all subjects that they take in that particular semester cancelled.
f. Students who make an illegitemate change on their grade will be suspended for a maximum period of two semesters. The suspension is not onsidered as terminal.
g. Students who do the aforemetioned violations with additional threat of violence or bribery (things or promises) or with deception will be expelled from the graduate program of FMUB.
h. Students who cheat during the process of writing their thesis will be given

sanction stipulated by the regulations in force.

L. Academic Schedule

Master's Program of Biomedical Science has two types of classes; regular and double-degree.In order to help students finish their study on time, the implementation of academic activities is scheduled as follow.

Regular class

No	Activities	Semester							
		I	II	III	IV	V	VI	VII	VIII
1	Compulsory subjects (13 credit units)	*							
2	Interest-compulsory and elective subject (17 credit units)		*						
3	Appointment of thesis advisor committee		*						
4	Research proposal writing		*	….	….	….			
5.	Research proposal seminar			*	….	….	….		
6	Thesis research			*	….	….	….	….	
7.	Data analysis and journal article writing			*	….	….	….	….	
8.	Research result seminar			*	….	….	….	….	
9.	Thesis writing			*	*	….	….	….	
10.	Feasibility test of thesis manuscript				*	….	….	….	….

*Regular agenda
...extension agenda

No	Activities	Semester							
		I	II	III	IV	V	VI	VII	VIII
1	Compulsory subject and interest-compulsory subject 24 credit units	*							
2	Interest and elective subject 6 credit units.		*						
3	The appointment of thesis advisor committee		*						
4	Research proposal writing		*	….	….	….			
5.	Research proposal seminar			*	….	….	….		
6	Thesis research			*	….	….	….	….	
7.	Data analysis and journal article writing			*	….	….	….	….	
8.	Research result seminar			*	….	….	….	….	
9.	Thesis manuscript writing			*	*	….	….	….	
10.	Feasibility test of thesis manuscript				*	….	….	….	….

*Regular agenda

...extension agenda

CHAPTER 4

CURRICULUM AND STUDY LOAD

The main competencies of Master's Program in Biomedical Sciences is "**creating graduates who have sublime characters, have the ability to develop and apply biomedical science in accordance to their concentrations and specialties, and also able to conduct laboratory works on cellular or molecular level**." The Master Degree of Biomedical Science supporting competency is "**creating master degree graduates who are able to develop related researches with certain evaluations: Degenerative-Metabolic, Herbal, Stem Cell, Autoimmune, Growth and Development, and Infection using instrumentation and molecular analysis technology in accordance to the specialty**."

The course credits of Master's Program of Biomedical Science are 40 *CREDITS* (credit per semester) which are scheduled for 4 (four) semesters and are possible to be accomplished in less than 4 (four) semesters and no more than 8 (eight) semesters including the thesis preparation (UB Guideline Book of Education 2009/2010, The Educational Minister of Republic of Indonesia's Decision no 232/U/2000, Guideline Book IV of *Borang* Filling, BAN-PT 2009 Accreditation, the edition of 7th January 2010).

The Curriculum Structure consists of 13 *credits* of compulsory courses, 10 *credits* of interest based courses, and 5 *credits* of elective courses in minimum. In addition, there is a Thesis Research in which the course credits are 12 *credits*, thus the minimum total of the obtained *credits* are 40 *credits*. The lecture will be carried out in two semesters (residence regulation), continued with the thesis research for 1-2 semesters. The total amount of meetings for each course are 16 times in a semester which is consist of lecture, discussions, assignments relating

to journals which are made along with the critical appraiser and resume, and examinations. Some courses arrange lab works for certain skills. The thesis organization is scheduled for two semesters in maximum (starts from the proposal writing until the thesis examination).

Based on the Study Program total amount that has been taken, in its implementation, Master's Program in Biomedical Science has two classes, regular class and double degree class.

Curriculum and the course credits of the regular class of the Master's Program in Biomedical Science are:

Compulsory Courses of Study Program	13 *credits*	(Semester I)
Interest Based Compulsory Courses	10 *credits*	(Semester II)
Elective Courses (minimum)	5 *credits*	(Semester II)
Thesis	12 *credits*	(Semester III&IV)
Total credits	minimum 40 *credits*	

Curriculum and the course credits of double degree class of Master's Program in Biomedical Science are:

Compulsory Courses of Study Program	13 *credits*	(Semester I)
Interest Based Compulsory Courses	10 *credits*	(Semester I&II)
Elective Courses (minimum)	5 *credits*	(Semester II)
Thesis	12 *credits*	(Semester III&IV)
Total credits	minimum 40 *credits*	

A. CURRICULUM AND COURSE CREDITS DISTRIBUTION

Regular class

	Code	Courses	*Credits*
Matriculation		Molecular Biology & Biochemistry	
	MAB6103	Cell Molecular Biology	2
	MAB6201	Molecular Genetics	2
	DKF6103	Instrumentation & Analytical Technology	2
1st Semester	DKF6104	Basic Immunology	2
	DKF6107	Research Methodology , Biostatistics & Scientific Writing	3
	DKF6106	Medical Biochemistry	2
		Total credits of 1th semester	**13**
For Pharmacology, Physiology, Toxicology, Histology-Anatomy concentration			
	DKF6202	Toxicology (Pharmacology, Physiology & Toxicology concentration)	2
	DKF6203	Growth and Development (Histology-Anatomy concentration)	
	DKF6207	Pathobiology	2
	DKF6209	Bioscience & Biotechnology	2
2nd Semester	DKF6214	Pharmacology & Molecular Physiology (Pharmacology, Physiology &Toxicology concentration).	2
	DKF6215	Medical Histology-Anatomy (Histology-Anatomy concentration)	
	DKF6216	Bioinformatics in Biomedical Science	2
		Elective (minimum)	5
		Total credits of 2nd semester (minimum)	**15**
For Microbiology, Parasitology, Immunology, Preventive Medicine and Clinical Medicine Concentration.			
	DKF6205	Advanced Immunology	2
	DKF6206	Molecular Biology of Infectious Disease	2
	DKF6204	Advanced Epidemiology (Preventive Medicine & Clinical Medicine concentration)	2
	DKF6207	Pathobiology (other concentrations)	
2nd Semester	DKF6209	Bioscience & Biotechnology (other concentrations)	2
	DKF6211	Basic Preventive Medicine (Preventive Medicine & Clinical Medicine concentration)	
	DKF6216	Bioinformatics in Biomedical Science	2
		Elective (minimum)	5
		Total credits of 2nd semester (minimum)	**15**
3rd & 4th Semester		**Proposal & Research**	**12**
		Minimum total of *credits* that must be obtained	**40**

Double degree class

	Code	Courses	*Credits*
Matriculation		Molecular Biology & Biochemistry	
	MAB6103	Cell Molecular Biology	2
	MAB6201	Molecular Genetics	2
1st Semester Blok 1	DKF6103	Instrumentation & Analytical Technology	2
	DKF6104	Basic Immunology	2
	DKF6107	Research Methodology, Biostatistics & Scientific Writing	3
	DKF6106	Medical Biochemistry	2
		Total credits of 1th semester	**13**
For Pharmacology, Physiology, Toxicology, Histology-Anatomy Concentration			
1st Semester Blok 2	DKF6202	Toxicology (Pharmacology, Physiology & Toxicology concentration)	2
	DKF6203	Growth and Development (Histology-Anatomy concentration)	
	DKF6207	Pathobiology	2
	DKF6209	Bioscience & Biotechnology	2
	DKF6214	Pharmacology & Molecular Physiology (Pharmacology, Physiology &Toxicology concentration).	2
	DKF6215	Medical Histology-Anatomy (Histology-Anatomy concentration)	
	DKF6216	Bioinformatics in Biomedical Science	2
		Elective: Clinical Pharmacology	1
		Total credits of 2nd semester (minimum)	**11**
For Microbiology, Parasitology, Immunology, Preventive Medicine, and Clinical Medicine Concentration.			
1st Semester Blok 2	DKF6205	Advanced Immunology	2
	DKF6206	Molecular Biology of Infectious Disease	2
	DKF6204	Advanced Epidemiology (Preventive Medicine & Clinical Medicine concentration)	2
	DKF6207	Pathobiology (other concentrations)	
	DKF6209	Bioscience & Biotechnology (other concentrations)	2
	DKF6211	Basic Preventive Medicine (Preventive Medicine & Clinical Medicine concentration)	
	DKF6216	Bioinformatics in Biomedical Science	2
	DKF6203	Growth and Development (Pediatrics & Neuroscience)	
	DKF6038	Elective: Clinical Pharmacology	1
		Total	**11**
2nd Semester		Elective (minimum)	**4**
		Total credits of 2nd semester (minimum)	**4**
3rd& 4th Semester		**Proposal & Research**	**12**
		Minimum total of *credits* that must be obtained	**40**

B. COURSES COMPILATION

a. The Compulsory Course of the Study Program

The study program's compulsory courses with 13 *credits* (credit per semester) as the course credits are the courses that must be obtained by each student of Biomedical Science Program from all kind of concentrations existed in Biomedical Study Program.

Table 1. The Compulsory Courses of the Master's Program on Biomedical Science

No	Code	Courses	*CREDITS* (credit per semester)
	MAB6102	Cell Molecular Biology*	3
1	MAB6103	Cell Molecular Biology**	2
2	MAB6201	Molecular Genetics	2
	DKF6101	Research Methodology and Basic Epidemiology*	2
	DKF6102	Medical Biochemistry*	3
3	DKF6103	Instrumentation & Analytical Technology	2
4	DKF6104	Basic Immunology	2
	DKF6105	Research Methodology (l)*	2
5	DKF6106	Medical Biochemistry**	2
6	DKF6107	Research Methodology, Biostatistics & Scientific Writing**	3
	UBU6101	English – 1*	*2*
		Total credits of courses	**13**

***) Abolished lecture**

****) New *lecture***

b. Interest Based Compulsory Courses

The Interest Based Compulsory Courses are the compulsory courses of certain concentrations in which the course credits are 10 *credits*.

Table 2. The Interest Based Compulsory Courses of the Master's Program on Biomedical Science

No	Code	Courses	*CREDITS* (credit per semester)
	DKF6201	Pharmacology & Physiology*	2
1.	DKF6202	Toxicology	2
2.	DKF6203	Growth and Development	2
3.	DKF6204	Advanced Epidemiology	2
4.	DKF6205	Advanced Immunology	2
5.	DKF6206	Molecular Biology of Infectious Disease	2
6.	DKF6207	Pathobiology	2
	DKF6208	Methodology – II*	2
7	DKF6209	Bioscience and Biotechnology	2
	DKF6210	Biostatics*	2
8	DKF6211	Basic Preventive Medicine	2
9	DKF6215	Medical Histology-Anatomy**	2
10	DKF6216	Bioinformatic in Biomedical Science **	2
	DKF6213	Introduction of Biostatistics*	2
11	DKF6214	Pharmacology & Molecular Physiology**	2

***) Abolished lecture**
****) New *lecture***

c. Elective Courses

Basically, elective courses (*P*) are the supporting topics for thesis in the second semester with the minimum course credits are 5 *credits*.

Tabel 3. Elective Courses of the Master's Program on Biomedical Science

No	Code	Elective Courses	*CREDITS* (credit per semester)
	DKF6001	Aging Process*	2
1.	DKF6002	Diabetes Pathobiology and Complication	2
2.	DKF6003	Free Radical in Biology/Disease	2
3.	DKF6004	ANS & CNS Physiology and Pharmacology	2
4.	DKF6005	Physiology and Cardio Vascular Pharmacology	2
5.	DKF6006	Endothel and Disease Dysfunction	2
	DKF6007	Hematology and Hemorheology*	2

6.	DKF6008	Traditional Medicine Development and Biotechnology	2
7.	DKF6009	Chemical Substance and Bioassay Analysis	2
8.	DKF6010	Biodiversity, Phytochemical, and Pharmacognosy	2
9.	DKF6011	Micronutrient Macro Pharmacology	2
10.	DKF6012	Endocrine	2
11.	DKF6013	Clinical Toxicology and Medicine Interaction	2
12.	DKF6014	Cellular Pathogenesis and Congenital defect Molecular	2
	DKF6015	Insecticidal Toxicology and Environmental *	2
13.	DKF6016	Environmental Toxicology	2
14.	DKF6017	Rheumatology	2
15.	DKF6018	Chemical Mediator/Inflammation Mediator	2
16.	DKF6019	Anti-Inflammation/Analgesic Medicine	2
17.	DKF6020	Cancer Pathobiology/HSP	2
18.	DKF6021	Bacteria and Blood Protozoan	2
19.	DKF6022	Medicine Resistance	2
20.	DKF6023	Infection Immunology	2
21.	DKF6024	Molecular Epidemiology	2
22.	DKF6025	Clinical Epidemiology	2
.	DKF6026	Genetic Population *	2
23.	DKF6027	Reproduction Physiology	2
	DKF6028	Enzymology*	2
	DKF6029	Embryology*	2
24.	DKF6030	Medical Entomology	2
25.	DKF6031	Field Epidemiology	2
.	DKF6032	Forensic Entomology*	2
26.	DKF6033	Vector Biotechnology	2
27.	DKF6034	Atherosclerotic Pathobiology	2
28.	DKF6035	Hypertension	2
29	DKF6036	Philosophical Science	2
30.	DKF6037	Medical Ethic and Law	*2*
31.	DKF6038	Clinical Pharmacology	*2*
	DKF6136	Internship-PBM-Interest Based Course (Physiology)*	2
32	DKF6136	Internship-PBM-Interest Based Course	2
	UBU6201	English – 2	1

***)Abolished lecture**

d. Final Activity (Semester III/IV).

The last activity of the course period is the research and writing process of thesis. This activity is allotted in the last semester, semester IV, however it can also be done in the 3rd semester.

Table 4. Courses and Final Activity of the Master's Program on Biomedical Science

No	Code	Activity	*CREDITS* (credit per semester)
1.	UBU6010	Thesis	12

C. STUDY SYLLABUS

a. Compulsory Courses

1. MAB 6103 Cell Molecular Biology
2 *credits*

After attending the lecture of this course, students are able to describe the processes of cell molecular biology accurately. The main discussions cover: cell molecular organization, structure and function of cell organelle; cell compartment. Both of them will be discussed in the molecular stage. The discussions of membrane system function include the ion canal concepts, membrane fluidity, protein confirmation, and electrophysiology. The conservation of molecular supra biological system of acto-myosin and tubulin dynein mechanism. Communication between each cell: cell signaling, receptor, and transmitter concept. The cell's growth and development: mitosis concept, cell cycle, and apoptosis. The mechanism of cell program expression will be slightly discussed and explained in the molecular genetics course.

Lecturers: Drs. Sofy Permana, MSc.,DSc *

Dr.Dra. Sri Widyarti, M.Si.

Prof.Drs. Sutiman B. Sumitro, SU.,DSc.

Widodo, S.Si.,M.Si.,PhD.,Med.Sc.

2. MAB 6201 Molecular Genetics
2 *credits*

After taking this course, students are able to carry out a genetic analysis for diagnosis, preventive, and curative in human's disease and genetic disorder context. The main discussions cover human cytogenetics (cell division,

chromosome, disorder, diagnosis-examination technique), basic molecular and inherited traits of genetic disease, a molecular level of genetic diagnostic in DNA level (in-del-point and repeats mutation, the disorder caused, examination and the diagnosis), population screening and genetics (not only applied to the patient as an individual but also to the society) and also the clinical aspect (pedigree, counseling, preventive and curative therapy and the development).

Lecturers: Dra. Diana Lyrawati, Apt.,MS.,PhD.*

Dr.rer.nat.Tri Yudhani M. Raras, M.App.Sc.

Dr.dr. Loeki Enggar Fitri, M.Kes.,SpParK

dr. Hidayat Sujuti, Ph.D.,SpM.

dr. Saifurrohman, SpJP.,Ph.D.

3. DKF 6103 Instrumentation and Biomolecular Analysis Technology 2 *credits*

After taking this course, students are able to do cellular and biomolecular level of laboratory analysis. The main discussions cover: a job preparation in laboratory, job principal, and the method of operating the instrumentation in the laboratory (spectrophotometer and flow cytometer) with the application analysis, the principle of DNA & RNA preparation method such as; DNA extraction and RNA extraction, the knowledge about vertical electrophoresis, western blot and dot blot along with the application are also given. This lecture also give special attention to immuno-staining method and bio-assay. All of these materials are explained in the lecture and demonstrated through lab works.

Lecturers: Dr.dr. Loeki Enggar Fitri, M.Kes., SpParK*

Prof.Dr.dr. Sumarno, DMM.,SpMK.(K).

Agustina Tri Endharti,SSi, PhD

Sasangka Prasetyawan, Dr.Drs.,MS.

Dr.drg. Nur Permatasari, MS

4. DKF 6104 Basic Immunology 2 *credits*

After taking this course, students may be able to explain the defense mechanism in relation with disease and other disorders accurately. The main discussion of this course of study is basics cellular or humoral body defense mechanism. The role of cellular and humoral defense mechanism, in relation with diseases and various forms of disorder as the result of the immunological interaction with the surrounded cells, will be studied.

Lecturers: Dr.dr. Kusworini Handono, M.Kes.,SpPK *

Prof.Dr.dr. Edi Widjajanto, MS.,SpPK.(K)

Prof.Dr.dr. Sumarno, DMM.,SpMK (K)

Prof.Dr.dr.Sanarto Santoso, DTM&H.,SpMK.(K).

5. DKF 6106 Medical Biochemistry 2 *credits*

After taking this course, students may be able to explain various processes of cellular biology and physiology mechanism. The main discussion covers: biochemical mechanism which becomes the fundament of normal biological and physiological mechanism, both on the organ or subcellular system level. Carbohydrate metabolism, protein and fat will be explained in the organ system theory, whereas second messenger biochesmitry mechanism and its effect in a variety of protein within the cell as the fundament of cellular biology and physiological mechanism will be explained within the cellular system theory. In the molecular observation, theories about DNA as the information storage and the regulation in the transcription process of DNA into mRNA and the mRNA translation into protein also the DNA destruction and its reparation process will be discussed .

Lecturers: dr.Hidayat Sujuti, Ph.D.,SpM.*

Prof.Dr.drh. Aulanni'am, DESS.

Dr.rer.nat.Tri Yudhani M. Raras, M.App.Sc.

dr.Saifurrohman, SpJP.,Ph.D.

6. DKF 6107 Research Methodology, Biostatistics & Scientific Writing 3 *credits*

Research Methodology, Biostatistics & Scientific Writing course is an application of phylosophy and the basic principle of research science and method which are being focused to the development of scientific thinking process in identifying health problems in order to be formulated into biomedical research problem. In the end of the semester, after taking this course, students are expected to be able to formulate the biomedical research problems and purposes according to the appropriate concept of framework and to choose the appropriate statistical analysis to solve the research problem. The main topics also included the knowledge about scientific writing, how to write, how to give critical appraiser and how to preventing plagiarism.

Lecturers: Dr.Dra.Sri Winarsih, Apt.,MSi *

Prof.Dr.dr. M. Rasjad Indra, MS.

Prof. Dr.dr. Edi Widjajanto, MS.,SpPK.(K).

Dr.dr.Budi Siswanto, SpOG.(K).

Dr.dr.Sri Andarini, M.Kes.

Dr.dr.Krisni Subandiyah, SpA.(K).

b. Interest Based Compulsory Courses

1. DKF 6202 Toxicology
2 *credits*

After attending the lecture of Toxicology for a semester which total credits are 2 *credits* (credit per semester), students are expected to be able to design toxicity tests, to analyze intoxication and toxicant transmission so that intoxication can be decreased and stopped. Moreover, it is expected that they can analyze the intoxication incidence both from the organ target and toxicant substance aspect which come from food and environment. Intoxication analysis is observed on a holistic existence, organ, and cellular level so that both the prevention or medicinal treatment alternative of the toxic effect from the substance can be discovered in the future and toxicology study can be developed. To achieve those competencies mentioned, the learning method can be given through lecture, discussion, journal reading, and paper writings which are presented in seminars.

Lecturers: Dr.dr. Setyawati Karyono, M.Kes.*

Dr.dr. Endang Sri Wahyuni, MS.

Dr.dr. Nurdiana, M.Kes.

2. DKF 6203 Growth and Development
2 *credits*

After completing this course, students are able to understand the foundations of the growth and developments including the types of growth and development aspects and all factors influencing the occurrence of the growth and development problems ranging from fertilization to neonates. Specifically students will be able to understand (i) the basic concept of embryology (ii) limitation and kinds of growth and development aspects, covering the development of various organs, abnormalities of development, factors affecting

the development including the impacts of nutrient, macro and macro nutrient, medicines, and infection are explained. (iii) ontogeny and development patterns of tissue, basic needs and factors influencing (iv) the gene mutation in the congenital defect is also explained on molecular level

Lecturers: Dra. Diana Lyrawati, Apt, MS, PhD *

dr.Pudjo Sanjoto, M.Kes, DAAK

dr. Ariani, SpA(K)

Dr.dr. I Wayan Arsana Wiyasa, SpOG.(K)

3. DKF 6204 Advanced Epidemiology
2 *credits*

After attending the lecture, students are able to analyze epidemiology data, plan the epidemiology study design to identify the health risk factor in individual and community and also the epidemiology usage in solving health problems (certain diseases). This course discusses the basic concept of epidemiology, epidemiology study's cycle, epidemiology parameter, epidemiology study design, and the epidemiology application on specific disease.

Lecturers: Dr.dr. Sri Andarini, M.Kes *

Dr.dr. Jack Roebijoso, M.Occ.

Dr.dr. Siswanto, MPH.

4. DKF 6205 Advanced Immunology
2 *credits*

After taking this course, students are able to explain the disease pathomechanism processes observed from immunology aspect. The main discussions cover: diseases pathogenesis which is related to the cellular and sub-cellular immunology process, protein mediator effect and lipid in the pathomechanism of immunologic diseases.

Lecturers: Dr.dr. Kusworini Handono, M.Kes.*

Prof.Dr.dr. Edi Widjajanto, MS.,SpPK.(K).

Prof.Dr.dr. Sumarno, DMM.,SpMK (K)

Prof.Dr.dr. Handono Kalim, SpPD.(KR)

Prof. Dr.dr. HMS. Chandra Kusuma, SpA.(K)

Dr.dr. Wisnu Barlianto, M.Kes.,SpA(K)

5. DKF 6206 Molecular Biology of Infectious Diseases
2 *credits*

After attending the lecture of this course, students may be able to explain the biomolecular phenomenon in its relation with the pathomechanism of infectious disease. The main discussions cover: molecular basis and immunopathogenicities of infectious diseases, and the characteristics of bacteria, virus, and parasite pathogenecities, development strategy of immunity system and vaccination.

Lecturers: Prof.Dr.dr. Sumarno, DMM.,SpMK (K)*

Prof.Dr.dr. Sanarto Santoso, DTM&H.,SpMK(K)

Prof.Dr.dr. Haryono Achmad, .SpPD,KGEH

Prof.Dr.dr. Teguh Wahyu Sardjono, DTM&H.,SpParK.

Dr.dr. Loeki Enggar Fitri, M.Kes.,SpParK

6. DKF 6207 Pathobiology
2 *credits*

After attending the lecture of Pathobiology course, students are able to explain disease pathogenesis accurately. The main discussions cover: pathobiology change and the mechanism of cellular physiology and biology

system changes as the result of a disease with an observation on molecular biology changes.

Lecturers: Dr.dr.Tinny Endang Hernowaty, SpPK *

Prof.Dr.dr. Djanggan Sargowo, SpPD,SpJP(K).FIHA.FCAPC.FESC

Prof.Dr.dr. Edy Widjajanto, MS, SpPK(K)

Dr.dr. Karyono Mintaroem, SpPA.

Dr.dr. Tatit Nurseta,SpOG(K)

7. DKF 6209 Bioscience & Biotechnology 2 *credits*

After completing this course, students are able to explain accurately the theoretical knowledge and practical skills to conduct research independently in the field of bioscience and technology. The topics covered include the Principles and Techniques of: method of basic culture consists of the basic aseptic technique and cell propagation, the serum's role within the media cell culture, and the nutrient within the cell culture including preservation and characterization, and also the separation of variable cell with centrifugation method. Moreover advanced method in flowcytometry like detecting apoptosis using flowcytometry, method for detecting cell cycle using flowcytometry and analyzing data from flowcytometry will be given. This lecture also give the method of RNA isolation, and principles and techniques of PCR and bio Assay as well as HPLC method..

Lecturers: Agustina Tri Endharti, Ssi, PhD*

Dr.dr. Loeki Enggar Fitri, M.Kes.,SpParK

8. DKF 6211 Preventive Medicine Basics
2 *credits*

After experiencing the lecture, students may be able to explain the concept and application of preventive medicine with biomedical approach on individual and community level. The introduction of preventive medicine will discuss preventive medicine basic concept basing on health determinant, interaction among human-environment-disease causes agent and the natural process of disease occurrences in individual and community; analyze the prevention strategy of infectious, degenerative, nutritive diseases on primary, secondary, and tertiary level; and also discuss the biomedical method and technology approach application in preventive medicine.

Lecturers: Dr.dr. Sri Andarini, MKes *

Dr.dr. Jack Roebijoso, M.Occ.

Prof.Dr.dr. Teguh Wahyu Sardjono, DTM&H.,MSc.,SpParK

Prof.Dr.dr. Djanggan Sargowo, SpPD,SpJP(K).FIHA.FCAPC.FESC

Prof.Dr.dr. Noorhamdani AS., DMM.,SpMK.

9. DKF 6214 Pharmacology & Molecular Physiology
2 *credits*

After taking the class, students may be able to explain (i) a few dynamic-pharmaco processes accurately. The main discussion covers: the effects of medicine or medical substance in cell or organ or animals and human completely, in a healthy or ill condition, with the intention of understanding the basic mechanism of the function of organization/healthy and ill cell (Pharmacodynamics). The effect of a healthy organ or human toward the kinetics of the medicine applied will be studied in pharmacokinetics. (ii) Explain the cell physiological process in cellular and molecular stage.

Lecturers: Dr.dr. Retty Ratnawati, M.Sc*

Prof.dr. M. Aris Widodo, MS.,SpFK.,Ph.D.

Prof.Dr.dr. M. Rasjad Indra, MS.

Dr.drg. Nur Permatasari, MS.

10. DKF 6215 Medical Histology-Anatomy
2 credits

After completing this course, students are able to understand the basic structures of human body constructors, anatomy and morphology of organs, and organ system of human, including musculoskeletal, respiratory system, cardiovascular system, digestives system, urogenital system, and neuroanatomy. Students are expected to be able to analyze movements of human body (kinesiology) and apply the science of histology-anatomy.

Lecturers: dr.Pudjo Sanjoto, DAAK.,MKes *

Prof. Dr. dr. M. Istiadjid ES, SpS, SpBS, M.Hum

Dr.dr.Karyono Mintaroem, SpPA

Dr.dr. Masruroh Rahayu, MKes

11. DKF 6216 Bioinformatics in Biomedical Science
2 credits

This course equips students with knowledge and abilities to analyze problems in biomedical science by using the bioinformatics methods. The topics cover: sequence alignments, database searching, comparative genomics, gene finding, gene structure, DNA motif and protein, prediction of 2D and 3D protein, characterization of protein function, metabolic pathways, gene network, gen expression and microarray expression, genomic and proteomic analysis, molecule dynamics and epitope mapping. The topics are related to their application in gen polymorphism analysis, target molecule identification for

therapy, molecular mechanism of disease, identification of function and gen pathway, vaccine design, and biomarker analysis.

Lecturers: Widodo, S.Si.,M.Si.,PhD.,Med.Sc. *

Prof. Dr. dra. Fatchiah, Msi.

Dra. Diana Lyrawati, Apt.,MS.,PhD.

Dr.rer.nat.Tri Yudhani M. Raras, M.App.Sc.