

# DOCTORAL DISSERTATION GUIDEBOOK



FACULTY OF AGRICULTURAL TECHNOLOGY  
UNIVERSITAS BRAWIJAYA  
2021/2022

# **GUIDEBOOK OF DOCTORAL DISSERTATION**



**ACADEMIC TEAM**

**FACULTY OF AGRICULTURAL TECHNOLOGY  
UNIVERSITAS BRAWIJAYA  
MALANG  
2021**

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## FOREWORD

One of the efforts of the Faculty of Agricultural Technology (FAT) Universitas Brawijaya in order to improve the quality and quantity of doctoral students is by compiling a dissertation guide book. This guidebook for the final project of the doctoral study program (doctoral) is expected to be a guide for all Doctoral Program students in the FAT environment in carrying out their final assignments and writing scientific papers in the form of dissertations, as well as a reference for the commission or board of examiners of the Doctoral Program in the FAT environment. The dissertation guidebook is specially prepared to serve as a basic reference in carrying out the final dissertation task, writing procedures, systematics and the format for typing a dissertation scientific work to achieve a doctorate degree. Several things have been inserted in this manual, including the logic of thinking, the reasons for the writing sequences used in this guide.

The preparation of the dissertation guidebook is carried out by accommodating all suggestions and opinions, especially from the FAT UB Senate, all Heads of Departments, and Heads of Study Programs in the FAT environment. FAT environment. S-3 students in compiling scientific papers are required to follow the provisions written in this writing guide. The board/commission of examiners are also expected to be able to read this book well, so that they can direct the writing format of the students they are mentoring.

The drafting team has tried to improve this edition, we believe there are still shortcomings, which of course can be improved in the future. We would like to thank the Drafting Team for publishing this Manual.

Malang, January 2021  
Dean,



Prof. Dr. Ir. Imam Santoso, MP

NIP 19681005 199512 1 001

**PART I**  
**DISSERTATION IMPLEMENTATION**

## CHAPTER 1 INTRODUCTION

A dissertation is a scientific work in the form of an exposition of a discussion that accompanies an opinion or argument. The opinion or argument itself is called a thesis. Generally, the term dissertation is the development of a thesis that is used with reference to a discussion of a skolar or academic nature which reveals problems and theories and explains the process and/or choice of problem solving forms whose validity and reliability have been proven through research using scientific methods. As a scientific paper, a dissertation is the result of a systematic study of a problem that contains methods of data collection, analysis and processing, and presents conclusions and proposes recommendations. In the FAT-UB Doctoral Program education system, The dissertation is part of the requirements for students to obtain a doctorate degree. The final project in the form of a dissertation can be started after the student has completed the doctoral coursework. At the end of the dissertation, Doctoral program students are required to make a research design, conduct seminars, and then obtain approval from the supervisory commission.

In writing a dissertation, the originality of the dissertation must be demonstrated with free and critical thinking. Dissertation writing is standard and can be defended in court. The dissertation is argumentative and resulted from a research process that has a certain weight of originality. Writing a dissertation (later) requires: clarity of argument, weight of argument, ease of understanding at least by the academic community, practical use for society and the profession. The dissertation always assumes the existence of certain theoretical arguments that are referred to.

Dissertation research is in the form of submitting a (new) theory, testing (application) of theory, and assessing the theory that has been documented. Arguments must be clear and explicit, will increase the reader's knowledge. The arguments are presented steadily, as reflected in the literature review and supporting data. The dissertation has the weight of novelty, in terms of developing a theory or concept, offering the right methodology, or exploring important data that has never been or is rarely done. This novelty will have a contribution to the development of the science involved. The dissertation must be comparable with other scientific works (comparison items: method, time/period or others).

This writing format guidebook was prepared with the aim of (1) uniforming the format for writing scientific papers in the FAT-UB Doctoral Program, (2) being used as a guide for students in writing scientific papers and as a supervisor/advisor commission in directing the writing of student scientific papers.

The supervisory committee for Doctoral Program students has academic responsibility for student scientific work, in terms of scientific truth and writing format. This academic responsibility is marked by the signature of the committee or board of examiners affixed in the approval sheet for student scientific work. Therefore, doctoral students must obtain the approval of each examiner to take the dissertation exam. There are differences in rights and powers between the board of examiners and examiners outside the supervisory/advisory commission. All examiners have the right to test students' abilities in defending their scientific work.



## CHAPTER 2. DISSERTATION

The advanced attribute in postgraduate education means that postgraduate education is built on the foundation of undergraduate education. For students, it has further meaning in the education they have achieved, and the mastery of the subject they are engaged in is deeper. In addition, the contextual elements of Doctoral education are that students can deepen their knowledge, broaden their horizons and skills and develop their intellectual maturity.

Research is an activity carried out according to scientific principles and methods systematically to obtain information, data, and information related to understanding and/or testing a branch of knowledge and technology (Permenristekdikti No. 44 of 2015 concerning National Standards for Higher Education). A dissertation is an academic paper that is the result of studies and/or in-depth research carried out independently and contains new contributions to the development of science, or finding new answers to problems (which temporarily) have known answers, or asking new questions on the subject. - things that are considered to have been established; in the fields of science, technology, and the arts; doctoral candidates under the supervision of their supervisors (Kepmendikbud No. 212/U/1999). According to the Regulation of the Chancellor of the University of Brawijaya No. 52 of 2018, a dissertation is an academic paper made based on the results of independent research by Doctoral Program students under the supervision and guidance of a supervisor

### 2.1. Doctoral Program

The Doctoral Program is the culmination of the implementation of the educational function of a university. From this program, it is hoped that lecturers, researchers, high-ranking officials in educational institutions, research, industry and companies, and government will be able to determine the direction of development of human resources, science, technology and art, and even the development of human civilization.

The difference in the characteristics of the Doctoral program from the S1 and S2 programs is mainly related to its approach emphasizing the involvement of individual students and lecturers in an intellectual peer community as well as in an academic program design and academic quality control. Here various processes of intensive and spontaneous exchange of thoughts and experiences occur between peers, between seniors and juniors, in the whole process of continuous discovery, transfer and dissemination of knowledge. The aim is to develop themselves (doctoral candidates) so that they are able to seek the truth of science or discover new knowledge, theories, concepts, methodologies, new models or software, or more efficient technology, or new objects or materials; able to use knowledge and skills within their area of expertise to find answers and/or solve complex problems including those that require a cross-disciplinary approach; be open, responsive to the development of science, technology and art, as well as problems faced by the community; able to communicate thoughts and the results of his work both with colleagues and with a wider audience; and familiar with the problems and the latest works and thoughts of experts in their area of expertise. able to communicate thoughts and the results of his work both with colleagues and with a wider audience; and familiar with the problems and the latest works and thoughts of experts in their area of expertise. able to communicate thoughts and the results of his work both with colleagues and with a wider audience; and familiar with the problems and the latest works and thoughts of experts in their area of expertise.

In Indonesia, currently there is only one kind of Doctoral program with the same requirements, namely completing a number of credits (semester credit units) well, conducting research and writing a dissertation, which ends with a dissertation exam called the final exam.

## 2.2. Dissertation and Research

The main requirements for completing the Doctoral program is a dissertation resulting from research. According to Permenristekdikti No. 44 of 2015 concerning National Standards for Higher Education, research activities carried out by students in order to carry out their final assignments, theses, theses, or dissertations must meet the provisions (1) are activities that meet scientific principles and methods systematically in accordance with scientific autonomy and academic culture . (2) Research activities must consider standards of quality, work safety, health, comfort, and security of researchers, society, and the environment (3) the learning outcomes of graduates, and (4) the provisions of regulations in higher education. Dissertation research must provide the *promovendus* with direct experience of research methods in the discipline concerned,

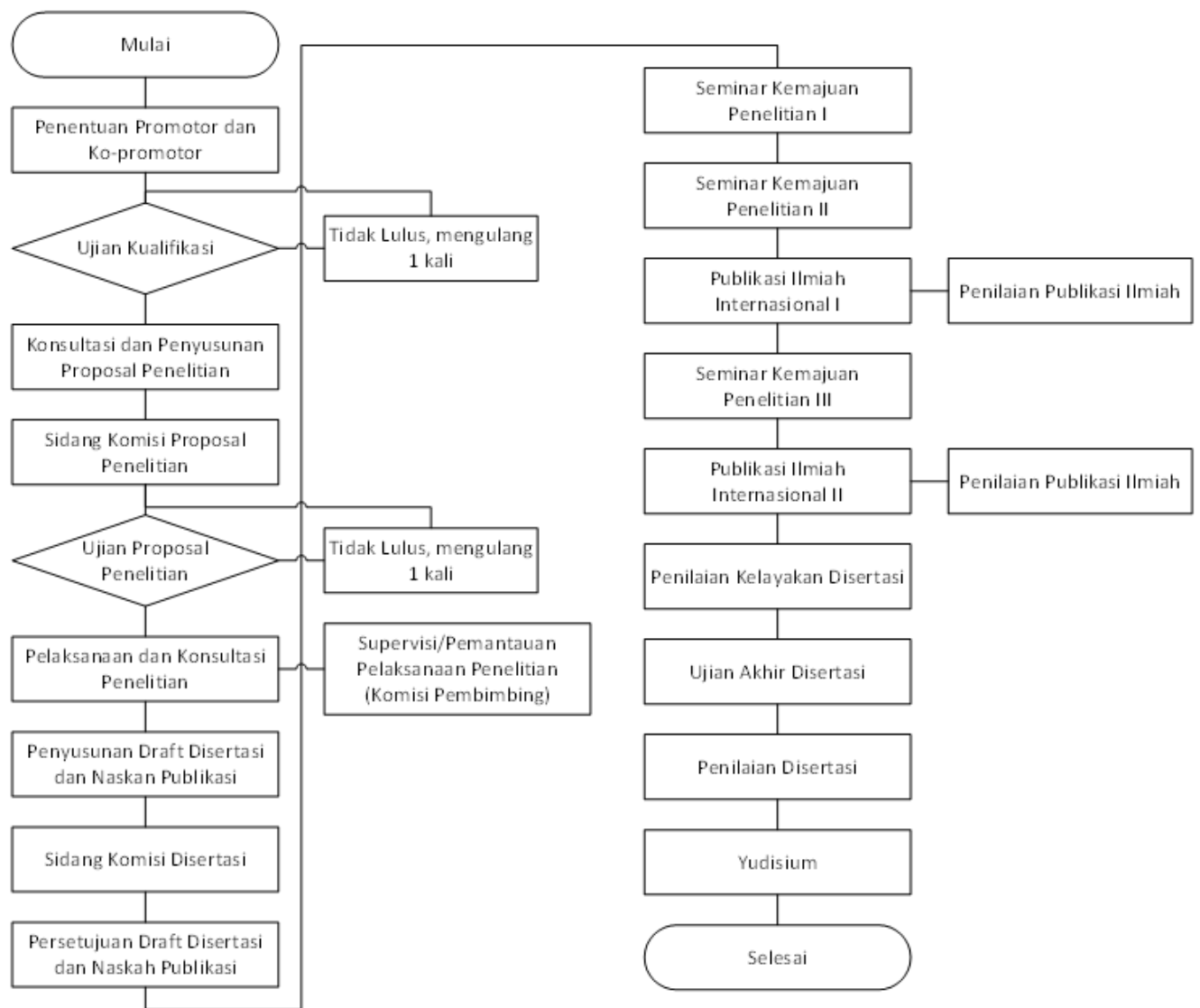
In general, research for a dissertation must be original, adequate, meaningful, and carried out independently. The meaning of these various requirements is determined by the respective disciplines. The educational functions of the Doctoral Program are (1) preparing basic researchers and lecturers, (2) preparing researchers to work in non-academic institutions where leaders or donors determine the research agenda, and (3) preparing professional implementers and (4) planners. Dissertation research to prepare non-researcher professions is of course different from research to prepare researchers. For preparing research staff, new theories are highly valued; Meanwhile, for professional implementers, they can still be allowed to use generally accepted theories in studying actual real-world problems to get answers to their solutions. However, even professional practice-oriented research often requires sophisticated theory and therefore uses advanced methods and understanding.

## 2.3 Originality, Independence and Meaning

In general, original research is research that has never been done before or that creates new knowledge. However, although the dissertation may not duplicate or constitute a repetition or copying of the work of other researchers or scholars (*plagiarism*); the topic or approach used is not entirely and must come from the *promovendus*. Promoters or other advisors or lecturers must be able to encourage students to find research topics with their own minds so that they are able to develop from their dissertations. Students should be able to indicate which part of the research is their own thinking. This ability is an indicator of the student's independence. The independence of student scientific work is closely related to its originality.

In certain disciplines, where the dissertation research work is part of a large project work carried out together (collaborative project or interdisciplinary research); the important thing is that the work given to students must be clearly defined. Whether in collaboration between lecturers and students, or among students. A student is expected to be able to show the uniqueness of his contribution and indicate which part of the great work is his own opinion and efforts.

The meaningful contribution of a dissertation to the repertoire of science is also a prolonged debate. This is up to the assessment of the supervisors and the dissertation assessment team who are closely related to the views of various different fields of science. However, the prevailing general view is that dissertation research is more of an instrument for training *promovendus* to become capable researchers, although as a significant contributor to the repertoire of knowledge, it is still important. One of the objectives of postgraduate research and mentoring is essentially to induce students into a research culture, which is expected to develop into independent researchers and become colleagues and mentors in the future.



**Figure 1. Standard Operating Procedures for Dissertation Implementation**



## **CHAPTER 3. FLOW OF THE DISSERTATION IMPLEMENTATION**

### **3.1. Dissertation Limits and Status**

1. Disertasi is an academic paper that is the result of in-depth and thorough research carried out independently and contains new contributions to the development of science and/or technology carried out by doctoral candidates under the supervision of their supervisors.
2. dissertation This is the final project that must be completed by every doctoral student at Universitas Brawijaya.

### **3.2. Dissertation Objectives**

1. The preparation of a dissertation is intended so that students are able to make a description, analysis, and synthesis of the facts/symptoms studied or the results of mathematical theory studies and/or designs with deep thought, and pour them into mathematical models and/or new designs that they build themselves, or modify/develop mathematical theoretical models, and/or pre-existing designs that can be proven in accordance with scientific rules.
2. Research is a rule-abiding activity in an effort to find the truth and/or solve problems in science, technology and/or art.

### **3.3. Forms of Activities to Get Data**

1. The data used as the basis for the preparation of the Dissertation must come from research activities, either in the form of surveys and/or experiments with a statistical/mathematical approach, or the results of an in-depth study of mathematical theories/models according to their scientific field.
2. Data must be obtained honestly, legally and free from elements of plagiarism.

### **3.4. Amount of Dissertation Study Load**

1. The dissertation has a study load of 28 credits (PSDTIP) and 30 credits (PSDIP).
2. The amount of study load is determined before the dissertation exam by the Dean of the Faculty administering the doctoral program/Director of the University Postgraduate Program at the suggestion of the Head of the Doctoral Study Program.
3. Further provisions regarding the details of the Dissertation study load, requirements, stages of implementation and all technical aspects related to the implementation of the Dissertation are regulated in the Handbook of the Faculty of Agricultural Technology.

### **3.5. Substance and Depth of Study/Review**

1. The substance of the dissertation is the development of science, technology, with the substance/material that must be in accordance with the scope of the scientific field in the study program where the student is registered.
2. The dissertation study must comply with KKN level 9.
3. The dissertation study must be in accordance with the scholarship of the student study program, have originality and novelty with a depth that is in accordance with KKN level 9.

### **3.6. Student Requirements, Obligations and Rights**

1. Students can carry out a series of activities related to the Dissertation after fulfilling the academic and administrative requirements that have been determined by the Faculty.

2. Students are required to compile a dissertation based on ethics and scientific manners, be honest and free from plagiarism elements and refer to the Faculty's dissertation guidebook
3. The promoter can use the data in the dissertation as material for publication in scientific journals/magazines or mass media with due observance of scientific ethics and manners.
4. All forms of output in the form of intellectual property rights, articles in scientific journals, etc. Those related to the material/substance of the dissertation are shared rights between students, their supervisors and the University.
5. In the event that the research implementation is in collaboration with other parties, the right to use data and all forms of output in the form of intellectual property rights and other forms is regulated in a cooperation agreement approved by the Dean of the Faculty.
6. The provisions for ownership and intellectual property rights resulting from the Dissertation, as referred to in the provisions in paragraph 4 are regulated separately by the Chancellor.

### **3.7. Qualifications, Determination, Rights and Obligations of Supervisors**

1. The dissertation is prepared independently by the students under the direction of the Advisory Lecturer Team which is chaired by a Promoter assisted by 2 (two) or more Co-promoters.
2. The promoter at least holds the position of Head Lecturer with a Doctoral academic qualification in the field of science or in one scientific sub-cluster in accordance with the study program in which the student is registered and has at least 2 (two) scientific works as the main author and/or as the corresponding author. published in reputable international journals.
3. The co-promoter has at least the position of Lector with a Doctoral academic qualification in the field of science or in one scientific sub-cluster in accordance with the study program where the student is registered and has at least 2 (two) scientific works as the main author and/or as the corresponding author published in reputable international journals
4. Based on "special considerations" and agreement with the Head of the Study Program, students can propose a co-promoter outside the Study Program who can help facilitate their dissertation activities, provided that point (3) is fulfilled and has KKN level-9 competence.
5. Promoters and Co-promoters are determined by the Dean of the Faculty.

### **3.8. Qualifying Exam**

1. Qualification exams are carried out to assess the academic ability of doctoral participants. A doctoral program participant has the right to take a qualifying exam if he has successfully taken a minimum of 12 credits of lectures with a GPA of at least 3.0, no score is less than B.
2. Qualification exams are carried out before the start of the preparation of the dissertation and passing this qualification exam is a condition for the preparation of the dissertation proposal to begin.
3. The form of assignments as material for the qualification exam is that students independently make scientific papers which can be considered as "pre-dissertation proposals". The preparation of this scientific paper was consulted with the supervisory committee.
4. Qualification exams are carried out orally and the assessment is carried out by the Supervisory Commission and Examining Lecturers.
5. Lecturers who examine the qualification exam have an academic position of at least Lector and the title of Doctor. The team of lecturers who examine the qualifications for each student is 2 people.

6. The minimum passing standard of the Qualification Exam is 70 or the equivalent of a B grade.
7. Students who do not pass the qualification exam are given the opportunity to repeat 1 (one) time.
8. Components of the assessment of qualification exams and their weighting include (a) Mastery of research methodology, (b) Mastery of the subject matter of the field of science, (c) Reasoning ability including the ability to abstract, systematize, and formulate ideas; both in writing and orally, and (d) The ability to communicate scientific thoughts in writing and orally in discussions.

Table 1. Components of Qualification Exam Assessment

No.	Assessment criteria	Rating Description	Weight (%)
CPMK 1	able to review literature	Review articles are well presented which are characterized by: 1. The background in Chapter 1 is presented in a sequence so that there is a common thread with the research problems that will be carried out 2. Chapter 2 (library review) well presented 3. 80% of the referenced libraries are primary libraries/research results 4. 75% of referenced libraries are up to date (last 10 years)	20
CPMK 2	mastering related scientific concepts	The conceptual framework is presented with which is characterized by: 1. the conceptual framework is well presented 2. there is a clearly presented concept diagram	20
CPMK 3	Able to formulate research problems	The problem formulation is very clear and well written which is characterized by: 1. The formulation of the problem to be studied is stated in clear sentences 2. The problems studied are up-to-date, there is no plagiarism or repetition 3. The benefits are well formulated and the benefits to society and science and technology are well illustrated	10
	Able to present the manuscript orally and defend it in front of the examiner	The ability of students to submit scientific arguments in answering questions	15
		Mastery of scientific substance and ability to present novelty	15
		Student reasoning ability in presentation	10
		Scientific writing includes the ability to systematize and formulate problems	10
Numerical Value (Amount)			
Quality Letters			

### **3.9. Research Proposal Preparation**

1. After the student is declared to have passed the qualification exam, the student can write a dissertation research proposal.
2. The pre-proposal that has been approved can be continued as a dissertation research proposal.
3. The dissertation research proposal contains a research plan for the final project of the doctoral dissertation program.
4. Students must consult with all supervisory committees until an agreement is reached on the scope of dissertation research between students and the supervisory committee.
5. Every time in consultation with the Promoter and Co-Promoter, students must fill out a logsheet according to Appendix 6 which is signed by the supervisor.

### **3.10. Research Proposal Commission Session**

1. Prior to conducting the proposal examination, the supervisory committee and students must conduct a commission session with the aim of reaching an agreement on the student research proposal with the supervisory commission.
2. The commission session was attended by the supervisory committee and students.
3. If the proposal has been approved by the supervisory committee, the student can submit a proposal exam.

### **3.11. Research Proposal Exam**

#### **a. Submission of dissertation proposal exam**

1. After the proposal is approved by the supervisory committee, students can take a dissertation proposal exam.
2. Students take care of the administrative process to the postgraduate administration of the Faculty of Agricultural Technology.
3. The head of the study program appoints 3 lecturers as examiners on the recommendation of the supervisory commission.
4. The requirements for examining a student's dissertation research proposal are at least a Doctoral degree with the position of Lector and having competencies similar to the student's research topic. The dissertation proposal review team is determined by the Dean's Decree.

#### **b. Implementation of the dissertation proposal examination:**

1. The dissertation proposal examination is conducted openly and must be attended by the supervisory commission and 3 examiners.
2. The assessment of the dissertation examination includes: a dissertation research proposal, mastery of research methods, mastery of theories relevant to the research topic and reasoning abilities, abstraction, systematic thinking and formulation of ideas
3. The value of the dissertation proposal examination is the average value of the supervisor and examiner commissions present.
4. Students are declared to have passed the dissertation proposal exam if they get an average score of at least B. The proposal exam can be repeated once for students who are declared unsuccessful.

Table 2. Components of the dissertation proposal exam assessment

No.	Assessment criteria	Rating Description	Weight (%)
1	Scripting ability	Very clear and very well written manuscript which is characterized by: 1. Relevant cited libraries 2. As many as 80% of the cited literature is primary/research results, not review literature 3. 75% of the literature cited is up to date (last 10 years) 4. Arranged systematically, deeply and coherently 5. Does not indicate plagiarism (10% plagiarism check) 6. Sentences are well structured, following the rules of PUEBI (General Indonesian Spelling Guidelines)	15
2	Clarity of problem objectives and benefits	The problem formulation is very clear and well written which is characterized by: 1. The formulation of the problem to be studied is stated in clear sentences 2. Goals are clear and in line with the method 3. The benefits are well formulated and the benefits to society and science and technology are well illustrated	15
3	1. Clarity of frame of mind 2. Clarity of research methods	Very clearly and very well written framework and methods characterized by: 1. It is clear that the background, problems and methods used in writing the flow of the framework are clearly described 2. In the method, it is clear the stages and designs used, as well as the resulting outputs 3. It is clear how the data analysis method will be used so that it is able to answer the dissertation problem	20
4	Ability to present proposals orally and defend them	1. Power point: in the form of points not sentences, interesting, aesthetic 2. Presentation with appropriate voice intonation, not too fast or slow, not memorized, mastering the audience, mastering the material 3. Correct and appropriate timing	5
		The ability of students to submit scientific arguments in answering questions	15
		Mastery of scientific substance and ability to present novelty	15
		Student reasoning ability in presentation	15
Amount (Number Value)			
Quality Letters			

### 3.12. Research Implementation

1. Students after completing the dissertation proposal exam then carry out research
2. During the implementation of dissertation research, students are required to consult the results and data obtained to the Advisory Commission
3. Monitoring of research implementation is carried out by various parties as described below.

### **3.13. Monitoring the Implementation of the Dissertation**

Monitoring of research implementation is carried out using (1) Research Control Card, (2) Dissertation Research Logbook, (3) Dissertation Progress Report, and (4) Research Implementation Supervision.

#### **1. Research Control Card (KKP)**

- a. The research control card (KKP) contains brief information about the progress of the research implementation on a regular basis (weekly).
- b. This KKP is held and filled out by students and regularly (monthly) is consulted and informed to the Advisory Lecturer.
- c. The supervising lecturer signs the KKP periodically when students consult.
- d. By the time students will carry out the seminar on the results of the Dissertation research, it is hoped that the KKP has been filled out completely and has been signed by the Promoter.
- e. KKP which has become one of the complete requirements for registering a research seminar.

#### **2. Dissertation Research Logbook**

- a. This logbook contains brief notes/information about things that students do in carrying out their research as well as notes that need to be provided by the supervisor on research problems faced by students, on a regular basis.
- b. The logbook can also be filled with notes/information on the results of library analysis conducted by students.
- c. This logbook is held and filled out by students and is regularly consulted and informed to the Advisory Lecturer.
- d. The supervising lecturer signs the Logbook periodically when students consult.
- e. The complete logbook (point d) is one of the complete requirements for registering a research seminar.
- f. Students can take the Logbook in the academic section by showing proof of having passed the dissertation proposal exam.

#### **3. Dissertation Progress Report (LKD)**

- a. Student Students who are carrying out the dissertation learning process are obliged to make a progress report on the implementation of research every mid-semester and at the end of each semester. Lreports on the progress of research implementation can be in the form of:
    - 1) Realization Report and Dissertation Completion Plan (all batches of students in any semester).
    - 2) Research Progress Reports (including data analysis and research results seminar materials) for students who program Research Progress Seminars I, II, and III.
    - 3) Progress Report on Writing Seminar Papers (for students who are programming for national/international seminars that can replace Research Progress Seminars I, II, and III as well as Scientific Publications)
    - 4) Dissertation writing progress report (for students starting to write a dissertation
- (1) Research Implementation Progress Report (2) Data Processing and Analysis

Progress Report, (3) Progress Report on Preparation/Writing of Seminar Papers and Dissertation Manuscripts.

- b. This progress report contains information about:
  - 1) Student Identity
  - 2) Dissertation Title
  - 3) Advisory Commission
  - 4) Overall Dissertation Schedule
  - 5) The substance of the Progress Report is in accordance with the stages of the Dissertation Progress Report as stated in point (a). In general, the Dissertation Progress Report should include:
    - a) Activities that have been completed, and their results.
    - b) Activities being carried out and time limits (schedule).
    - c) The planned activities will be carried out along with the time schedule.
- c. This progress report must be approved and signed by the Promoter.
- d. This progress report is addressed to the Head of the Doctoral Program.
- e. Progress reports are made in five copies, each for students, promoters, co-promoters 1, co-promoters 2, and the head of the doctoral program.
- f. Progress reports are submitted to the academic section and students are given proof of receipt of progress reports.
- g. Submission of this Progress Report can be done at any time.
- h. This progress report will be used by the Promoter as one of the considerations in assessing the implementation of the dissertation research.
- i. This progress report will be used by the Head of the Doctoral Program to monitor the smoothness of the Dissertation learning process carried out by students.
- j. This dissertation progress report will also be reported to the student's institution of origin.
- k. Submission of progress reports to the student's home institution is carried out by the Head of the Doctoral Study Program.
- l. The Dissertation Progress Report is also one of the requirements that must be met as a requirement for student re-registration every semester.

#### 4. Supervision of Research Implementation

- a. Research Supervision The dissertation is carried out for research using experimental methods carried out in the laboratory, greenhouse, and/or in the field.
- b. Dissertation research that uses the survey method is not supervised by research, unless there are special considerations.
- c. Research supervision is carried out with the aim of (1) proving whether the implementation of research is in accordance with what is planned in the research proposal, and (2) finding solutions to problems faced by students in carrying out their research in the laboratory and/or in the field.
- d. Research supervision is carried out once by the Promoter or Co-promoter appointed by the Promoter to represent it.
- e. The supervising lecturer who carries out research supervision is obliged to make a supervision report and at the same time an assessment of the implementation of research.
- f. The Research Supervision Report contains information on:
  - 1) Identity of Students and Supervisors who supervise.
  - 2) Dissertation Title.
  - 3) Title/research activity being carried out.
  - 4) Problems faced by students in conducting research.
  - 5) Documentary evidence of research implementation.

- 6) Other information deemed necessary.
- 7) Funding for research supervision is borne by the student. Provisions regarding this matter are stipulated by the Decree of the Dean.

#### **3.14. Drafting of Dissertation and Publication Manuscripts**

1. During the research, students are advised to process data and prepare drafts of dissertations and publications.
2. During the preparation of the draft dissertation publication, students are required to consult with the Advisory Commission
3. Every time for consultation, students are required to fill out a logsheet signed by the Advisor.

#### **3.15. Dissertation Commission Session**

1. Prior to conducting a research results seminar (a seminar after the research and dissertation draft has been prepared, and is not a dissertation progress report), the supervisory commission and students must conduct a commission session with the aim of reaching an agreement on the dissertation manuscript between students and the supervisory commission.
2. The commission session was attended by the supervisory committee and students.

#### **3.16. Research and Research Progress Seminars I, II and, III**

Student research activities produce research data that are worthy of publication in national/international scientific seminars or published in reputable international journals and/or accredited national journals, and can be used in the preparation of their dissertation. Assessment of the implementation of dissertation research is carried out by all members of the supervisory commission (promoter and co-promoter) in accordance with applicable regulations. One of the 3 dissertation research advancement seminars can be replaced by participation in a national/international seminar as a presenter. In participating in the seminar, students are assigned to compile papers which will be assessed by the promoter team.

##### **Requirements for Research Progress Seminar (SKP) Dissertation**

- a. Condition
 

Seminarthe progress of dissertation research is carried out by students after carrying out research and has a dissertation draft that is approved and signed by the supervisor team, and a draft of journal articles and has fulfilled all administrative requirements in accordance with applicable regulations. The seminar on research results was attended by a team of supervisors and examiners and was open to the public.
- b. Implementation of Research Progress Seminar.
  1. The research team of the Research Progress Seminar consists of:
    - a. Promoter (one person).
    - b. Co-Promoter(two people or three people).
    - c. Examining Lecturers other than the Advisory Commission (three people).
  2. Seminars can be held if attended by at leasttwo examiners and two supervisors (Promoter and/or Co-promoter).
  3. In the event that the Promoter is unable to attend the seminar, it must delegate it to Co-Promoter 1 to represent it. Promoters/examiners who are not present in the seminar forum.
- c. Procedure for Assessment of Research Progress Seminar.
  1. Assessment done byall promoters, co-promoters and testers present. Promoters and co-promoters who are not present at the Research

- Progress Seminar forum are not required to conduct an assessment.
2. SKP assessment components broadly consists of:
    - a. Drafts of journal manuscripts and dissertation manuscripts,
    - b. Presentation of papers in seminars and
    - c. Discussion during the seminar.
  3. Committee the seminar conducts an assessment using the format and weight of the SKP assessment determined by the study program.
  4. MarkSKP is the average of the scores of all supervisors and examiners who are present and provide assessments. SKP value is stated in the form of Quality Score and Letter Value.
  5. The minutes of the results of the assessment of the dissertation SKP are signed by the chairman of the session and all the examination committee (examiners) present.
- d. Suggestions from the Research Progress Seminar Forum.
1. Suggestions from each examiner is written in the "suggestion sheet" which has been provided by the PPS Academic Sub-Section or in the PS/Faculty.
  2. Committee The seminar agreed and determined what suggestions students could use to improve their dissertation manuscript.
  3. Students are obliged to improve their dissertation manuscript while consulting with the Promoter and/or Co-promoter.
  4. If deemed necessary, students can consult with competent examiners.
  5. The supervisory committee is responsible for improving the dissertation manuscript based on agreed recommendations.
- e. Implementation Procedure.
1. Students fill out and complete the required data and information in the required documents, including an agreement on the date of the seminar which is agreed upon by all promoter teams and examiners.
  2. Students who have received approval from the promoter team to carry out SKP immediately reports to the Head of the Doctoral Program to determine the schedule for the implementation of the progress seminar.
  3. Students then register for the Academic Section, as well as take the documents for the academic administration requirements for research progress seminars.
  4. Students return to the Academic Section to show the completeness of academic requirements and get approval.
  5. Students consult with the Head of the Doctoral Program to report the date, time and place of implementation SKP by showing:
    - a. Approval of the completeness of the requirements from the Academic Section.
    - b. Dissertation drafts, dissertation summaries and draft journal articles.
  6. The Academic Section makes SKP invitations.
  7. The Head of the Doctoral Program (on behalf of the Dean/Director of PPS) signs the invitation.
  8. The Academic Section distributes invitations and manuscripts to all committees of research progress seminars.
  9. Students reproduce the draft summary of the dissertation as much as 20 - 25 copies to be submitted to seminar participants at the time of the seminar and to all seminar committees 5 days before the seminar
  10. The Academic Section together with students prepare the technical implementation of the SKP, including distribution of invitations and seminar papers, as well as announcements of research progress seminars to all students.
  11. Academic Section coordinate with the Head of the Doctoral Program to prepare the files needed in the implementation of the SHP, including the

draft dissertation summary and journal articles that have been reproduced.

12.Seminar on research results is carried out within 90- 120 minutes, led by a designated student participating in the Doctoral Program.

13.Exam minutesThe SKP is signed by the Promoter/Co-promoter.

14.The minutes of the SKP and other files that have been signed by all the seminar committees present are submitted in a closed state to the PPS/PS/faculty Academic Section. The submission of these files is carried out by the Promoter or his/her designated representative.

Table 3. Research Assessment Components and Research Progress Seminars I, II, and III or Progress Seminars through National/International Seminars

Assessment criteria	Score (1-100)	Weight	Value Number x Weight
A. Research competence (50%)			
1. Commitment and persistence	.....		
2. Initiative and creativity	.....		
3. independence	.....		
4. Efficiency at work	.....		
5. Research skill development	.....		
<b>Research Competency Average</b>	.....	0.50	.....
B. Dissertation Progress Report 30%			
1. Research relevance, clarity of purpose	.....		
2. The theoretical basis and use of literature	.....		
3. Use of methods and data	.....		
4. Discussion	.....		
5. Clarity of conclusions and recommendations	.....		
6. Writing	.....		
<b>Dissertation Progress Report Average Score</b>	.....	0.30	.....
C, Presentation 20%			
1. Verbal presentation	.....		
2. Mastery of the field of science	.....		
<b>Presentation Average</b>	.....	0.20	.....
<b>Total Number Value</b>			.....
<b>Letter Value</b>			.....

Table 4. Components of Research Assessment and Progress Seminars through National/International Seminars

Assessment criteria	Score (1-100)	Weight	Value Number x Weight
A. Research competence (50%)			
1. Commitment and persistence	.....		
2. Initiative and creativity	.....		
3. independence	.....		
4. Efficiency at work	.....		
5. Research skill development	.....		
<b>Research Competency Average</b>	.....	0.50	.....
B. Articles 30%			

Assessment criteria	Score (1-100)	Weight	Value Number x Weight
1. Research relevance, clarity of purpose	.....		
2. The theoretical basis and use of literature	.....		
3. Use of methods and data	.....		
4. Discussion	.....		
5. Clarity of conclusions and recommendations	.....		
6. Writing	.....		
<b>Article Average</b>	.....	0.30	.....
C, Presentation 20%			
Seminar/conference quality assessment)	.....		
ppt quality	.....		
<b>Presentation</b>	.....	0.20	.....
<b>Total Number Value</b>			.....
<b>Letter Value</b>			.....

### 3.17. International Scientific Publications I and II

According to the UB Chancellor's regulation no. 52 th 2018, every Doctoral Program student is required to take and complete a final project in the form of a dissertation and scientific publication. The final project in the form of Scientific Publication as referred to is prepared based on the results of the Dissertation research. The scientific publications are in the form of:

- 2 (two) scientific articles in international Scientific Journals indexed by Scopus or Web of Science Core Collection (Thomson Reuter), having the lowest impact factor of 0.1, or Microsoft Academic Search; or
- 1 (one) scientific article in a scientific journal as referred to in (a) and 1 (one) article in the proceedings. One of the Scientific Publications must be written by the student as the first author.

Students must consult the supervisory committee regarding the name of the scientific journal to be addressed and the research results to be written in the journal. During the doctoral study program, students are required to publish the results of research in scientific journals as many as 2 articles in accordance with UB Chancellor's regulation no. 52 of 2018. The assessment of the quality of articles is determined by the Dissertation Quality Assurance Team from each doctoral study program at the UB Faculty of Agricultural Technology. Students who can publish 2 (two) international scientific journals at least Q3 from the results of their dissertation research have the right not to be assessed for their dissertation eligibility by the Dissertation Quality Assurance Team from each doctoral study program at FAT UB. Student publications will be assessed by the Promoter and 1 member of the Dissertation Quality Assurance Team.

### 3.18. Dissertation Quality Assurance Team

- Team **Dissertation Quality Assurance is an ad hoc team formed to assess the feasibility of a dissertation**
- The team is a lecturer representative from the scientific field (laboratory) in the study program and is proposed by the Head of the Doctoral Study Program to the Dean and determined based on the Dean's Decree
- The work period of the Dissertation Quality Assurance team is 2 years and after that a new Dissertation Quality Assurance team is formed.
- The requirements for members of the Dissertation Quality Assurance Team are
  - Functional position of Professor or Head Lector

2. Having experience in one publication in a reputable international journal (minimum Q3)
- e. For the process of assessing the feasibility of the dissertation quality, students submit registration for the feasibility assessment of the quality of the dissertation to the Academic Section by submitting 3 copies of the dissertation manuscript that have been approved by the Advisory Commission.
- f. The Head of the Doctoral Study Program determines 2 assessment teams on the proposal of the Advisory Commission.
- g. The Dissertation Quality Assurance Team provides an assessment of the feasibility of the dissertation manuscript in accordance with the following assessment components:

Table 5. Components of Dissertation Quality Feasibility Assessment

No	KComponent Rating	Bweight %
1.	Originality/authenticity of ideas	10
2.	Novelty/newness	10
3.	Compatibility with the field of study program	10
4.	The accuracy of the approach used	10
5.	Up-to-date research methods and data acquisition	10
6.	Difficulty level in data acquisition	10
7.	The current and primary references used	5
8.	Pouring ideas and results of analysis and synthesis into writing	10
9.	Depth of discussion and ability to express the results of data interpretation and analysis results -synthesis in a comprehensive manner	20
10.	Ability to conclude and provide recommendations from research results	5
<b>Jumlah</b>		<b>100</b>

- h. The Dissertation Quality Assurance Team, apart from providing an assessment, also provides suggestions and input for the improvement of the dissertation manuscript.
- i. The results of the assessment from the Dissertation Quality Assurance Team are used as a component in the final assessment of the dissertation.

### 3.19. Publication Rating

The publication assessment is carried out by the Dissertation Quality Assurance Team from each study program. Students submit 2 publications to the Academic Section and then the Head of the Study Program determines two members of the Dissertation Quality Assurance Team to conduct an assessment of publications in accordance with the assessment form that has been determined (Appendix 1.5).

Table 6. Components of Assessment of International Scientific Publications I and II

No	KComponent Rating	Bweight %
1.	Publishing Quality of Journals/Proceedings	15
2.	Introduction	10

No	KComponent Rating	Bweight %
3.	Methods	15
4.	Results and Discussion	30
5.	Conclusion	5
6.	Reference	10
7.	Abstract	5
8.	English Quality	10
<b>Amount</b>		<b>100</b>

Table 7. Components of the Assessment of International Scientific Publication Guidance I and II

Rating Points		Rating Score				Proportion (%)	Mark
		1	2	3	4		
1	Completeness of the journal is fulfilled according to the journal/proceeding guidelines and the required conditions					20	
2	Revisions were carried out well and reviews from reviewers were responded well					30	
3	Seriousness in compiling journals					10	
4	Independence in compiling journals					10	
5	Difficulty level in publication					10	
6	Timeliness in preparing journals					10	
7	Intensity of mentoring					10	
		Total Value					
		Final Score = Total Score : 4					

Description:

1 = Bad, 2 = Fair, 3 = Good, 4 = Very good

### 3.20. Dissertation Feasibility Assessment by the Dissertation Quality Assurance Team

1. The requirements for the dissertation eligibility assessment are as follows:
  - a. Have passed the research result seminar
  - b. Have made improvements to the dissertation manuscript
  - c. The dissertation manuscript has been approved by the supervisory committee and has met the administrative requirements that have been determined
  - d. Include proof of plagiarism free from FAT UB with the allowed plagiarism rate of 20%.
  - e. Have a published manuscript that has been accepted to be published in international journals or proceedings in accordance with UB Chancellor's Regulation no. 52 Year 2018.
2. Procedure for conducting the dissertation feasibility assessment:
  - a. Students register for an eligibility assessment at the Doctoral Program Chair.
  - b. Students submit files for dissertation feasibility assessment, including:
    - Dissertation manuscript
    - Publication manuscript
    - Evidence of acceptance of manuscripts from international scientific journals
    - Proof of proceedings (if any)
3. The dissertation feasibility assessment is carried out by desk evaluation by 2 (two) members of the Dissertation Quality Assurance Team with expertise

relevant to the dissertation research topic. The appraiser gives an assessment in the form provided within 2 weeks from the time the assessment files are submitted.

### 3.21. Dissertation Final Exam

1. Condition
  - a. The dissertation manuscript has been approved and signed by all supervisors (Promoter and all Co-promoters).
  - b. Has fulfilled all academic administrative requirements in accordance with applicable regulations.
  - c. The dissertation manuscript has been approved and signed by all supervisors (Promoter and all Co-promoters).
  - d. Has fulfilled all academic administrative requirements in accordance with applicable regulations.
  - e. The dissertation manuscript has been assessed for feasibility by the Documentation Quality Assurance Team.
  - f. Has fulfilled all financial administration requirements in accordance with applicable regulations.
  - g. Register for the final dissertation examination in the academic section. Registration is done 10-15 days before the exam.
2. The Dissertation Final Examination Committee consists of:
  - a. Chairperson of the session (Promoter).
  - b. Co-promoter (2 people).
  - c. Examiner lecturer from Universitas Brawijaya (2 people).
  - d. One person "Guest Examiner", an expert from outside the University of Brawijaya who has expertise in a field that is in accordance with the contents of the dissertation.
  - e. The Guest Examiner is proposed by the Promoter to the Head of the Doctoral Program, and is determined by the Dean's decree.
  - f. An open dissertation examination can be carried out if attended by at least two people from the supervisory commission (Promoter and/or Co-promoter), two dissertation assessors (examiners) and or an outside examiner. Deviations from this provision require special approval from the Head of the Doctoral Program.
3. The components of the final examination of the dissertation are as follows:

Table 8. Assessment Components of the Final Dissertation Examination

Assessment criteria	Score (1-100)	Weight	Value Number x Weight
A. Originality and Recency 20%	.....	0.20	.....
B. Dissertation Manuscript 50%			
1. Research relevance, clarity of purpose	.....		
2. The theoretical basis and use of literature	.....		
3. Use of methods and data processing	.....		
4. Discussion	.....		
5. Clarity of conclusions and recommendations	.....		
6. Writing	.....		
<b>Dissertation Writing Average</b>	.....	0.50	.....

C, Ability to defend dissertation and presentation 30%			
1. Ability to defend dissertation	.....		
2. Mastery of the field of science	.....		
3. Verbal presentation	.....		
<b>Average score defending dissertation and Presentation</b>	.....	0.30	.....
<b>Dissertation Exam Total Score</b>		1.0	.....

#### 4. Completion of dissertation revision

- After being declared to have passed the final dissertation exam, the student concerned is given 1 (one) month to make a revision (if any).
- The revised dissertation manuscript, signed by the supervising commission and KPS-S3 and then submitted to the postgraduate program of the Faculty of Agricultural Technology.
- If up to 1 (one) month the student has not submitted his dissertation manuscript to the postgraduate academic section of the Faculty of Agricultural Technology, the value of the student's dissertation is reduced by one level.
- If within 1 (one) month the dissertation manuscript has not been submitted, the student's dissertation score is lowered according to the following table:

No.	Lateness	Decreasing Value
1.	1 month	grade
2.	2 months	1 grade
3.	3 months	Repeat Exam

- In accordance with UB Chancellor's Regulation No. 52 of 2018, the promoter may propose to the Dean that students are declared to have obtained a Dissertation A score without an exam if they meet the following requirements:
  - At least two articles that have been published or accepted for publication in international scientific journals indexed by Scopus or Web of Science Core Collection (Thomson Reiter) which have the lowest quality Q3 and/or have the lowest impact factor 0.1
  - The average value of all stages of the dissertation exam/seminar A
  - The dissertation manuscript has been evaluated and approved by the Promoter Team and disseminated in scientific forums at the faculty/postgraduate level.

### 3.22. Assessment of Learning Outcomes for Dissertation

- In the event that the material/substance of the dissertation consists of several sub-researches, it must be a unified whole research work that is interrelated or in series.
- Student learning outcomes on the implementation of the Dissertation are assessed starting from the process of preparing proposals, implementation, reporting, scientific articles/papers and exams.
- The research form for each stage of the dissertation is regulated in the Handbook of the Faculty administering the Doctoral Program/University Postgraduate Program.
- Referring to the Rector's Regulation No. 52 of 2018 Article 4 concerning Dissertations and Scientific Publications, students are required to use Dissertation materials/substances to compile 2 (two) scientific articles in

reputable International Scientific Journals (which are indexed by Scopus or Web of Science Core Collection (Thomas Reuters) or 1 (one) ) scientific articles in reputable International Scientific Journals and 1 (one) article in Scopus indexed proceedings, and students are still required to compile a Dissertation to be assessed by the Examining Lecturer Council in an Exam

5. In the event that a student is declared to have obtained an A dissertation score without a final exam, the student is required to produce two scientific articles that have been published or accepted for publication in an International Scientific Journal indexed by Scopus or the Web of Science Core Collection (Thomas Reuters) which has the lowest impact factor of 0.200; the average value of all stages of the Dissertation examination/seminar A; and the dissertation manuscript has been evaluated and approved by the Promoter Team and disseminated in scientific forums at the Faculty / Postgraduate.
6. The student's proposal to get an A dissertation score without a final exam is made by the Promoter to the Dean/Director of Postgraduate.

### **3.23. Doctoral Program Study Evaluation**

Study evaluation is carried out to ensure the seriousness of students in pursuing doctoral program education at FAT UB. The procedure for evaluating the study of doctoral students is as follows:

1. Postgraduate Administration / Academic Subdivision sends a list of doctoral program students who are subject to study evaluations at the end of each year
2. The criteria for students who receive study evaluations are GPA < 3.00 for the best 12 credits in the first semester
3. The Head of the Doctoral Study Program evaluates studies based on the list of student names sent by the Postgraduate Administration/Academic Subdivision
4. First semester evaluation
  - a. Students who at the end of the first semester do not have a GPA > 3.00 for the best 12 credits will be warned and required to make a statement
  - b. If at the end of the following academic year, the GPA for the best 12 credits does not reach 3.00, the student is asked to submit his/her resignation.
5. Final evaluation of the study
  - c. Students who have a study period of 6 years are given a warning and a statement letter to immediately complete their studies
  - d. If at the end of the 7th year the study period has ended and the student cannot complete his studies, then the student is asked to resign.
6. Students who do not pass the qualifying exam will be given a warning letter and a statement. If the second qualification exam does not pass either, then the student is asked to resign.
7. Students who do not pass the dissertation proposal examination will be given a warning letter and a statement. If the second dissertation proposal exam does not pass, the student is asked to resign.
8. Students who do not pass the dissertation exam will be given a warning letter and a statement. If the second dissertation exam does not pass either, then the student is asked to resign.
9. If a student who has been given a warning letter and signed a statement does not show improvement in accordance with points 4, 5, 6, 7, and 8, then the student is asked to resign.
10. If the student does not respond after being given a warning according to points 4, 5, 6, 7, and 8, then the student is proposed to the University for expulsion (drop out).
11. Resignation process:
  - a. The student submits a letter of resignation to the Vice Dean for Academic Affairs.
  - b. The Academic Sub Division will process the resignation letter

- c. Students are entitled to a Study Result Card that can be used to continue their studies at other universities.
- 12. Drop out letter issuance process:
  - a. FAT UB Academic Team consisting of Deputy Dean for Academic Affairs, Head of Academic Subdivision, Staff of Academic Subdivision, Head of Department, Secretary of Department and Head of Study Program held a meeting to follow up on the names of students who have the potential to drop out.
  - b. From the results of the meeting, it was decided the names of students who were proposed to drop out by considering input from the Head of the Department, Secretary, and KaPS
  - c. The Academic Sub-Section proposes a drop out application letter to the Vice Chancellor for Academic Affairs
- 13. Students who do not re-register for semester 2 in a row will be given a warning and asked to make a statement letter to continue their studies or resign.
- 14. If the student is going to continue his studies then all financial obligations must be completed and the student can re-register before the new semester

### 3.24. Doctoral Program Judisium

Yudisium is implemented after students can complete all academic and administrative requirements, namely:

- 1. Have fulfilled all academic requirements (lectures and academic assignments) and administrative and passed the final exam
- 2. GPA > 3.00 during the study period
- 3. Complete other requirements set by the study program and register for a yudisium no later than 1 month after the exam.
- 4. If within 1 (one) month the student has not submitted the complete judicial documents, the student's dissertation score will be lowered according to the following table:

No.	Lateness	Decreasing Value
1.	1 month	grade
2.	2 months	1 grade
3.	3 months	Repeat Exam

- 5. Judicial implementation
  - a. The Yudisium was held openly attended by promoters, co-promoters, test teams, invitees, and students
  - b. The head of the doctoral study program acts as the head of the judiciary
  - c. In the graduation, students explain the results of their research followed by the submission of reviews of student research results by the promoter, co-promoter, and the examiner team.
  - d. Students are declared to have passed the graduation in accordance with the predicate of graduation from the doctoral program.

### 3.25. Doctoral Program Graduation Predicate

Students who are declared passed will receive the following graduation predicate:

- 1. Graduated with "Compliments" (Cumlaude), the requirements are:
  - a. GPA of the courses and supporting courses for the dissertation > 3.75, without a B grade.
  - b. Dissertation Value A.
  - c. Publish the results of his dissertation research in more than one international scientific journal article title with impact factor indexed by Scopus, web of science (at least there is a letter of acceptance of the article).
  - d. The maximum length of study is eight semesters.

2. Graduated with "very satisfactory" predicate, the requirements are:
  - a. Does not meet the requirements in point (1) and,
  - b. Achieved  $3.50 < \text{GPA} \leq 3.75$  (total for lectures and dissertation)
3. Graduated with "Satisfactory" predicate, the requirements are:  
Achieved  $3.00 \leq \text{GPA} \leq 3.50$  (total for lectures and dissertation) This graduation predicate is determined by the Dissertation Final Examination Committee and ratified by the Dean and announced at the graduation.

## CHAPTER 4. COURSES OF DISSERTATION IMPLEMENTATION

### 4.1. Doctoral Program Dissertation Course

Doctoral program students are required to program dissertation courses according to the courses, credits, and semesters that will be run.

DISSERTATION COURSES					
			credits		sem
1	TPF92001	Qualification	1	W	2
2	TPF9202	Dissertation Proposal	2	W	2
3	TPF91001	Research Progress Seminar I	6	W	3
4	TPF92003	Research Progress Seminar II	6	W	4
5	TPF91002	International Scientific Publications I	2	W	5
6	TPF91003	Research Progress Seminar III	6	W	5
7	TPF92004	International Scientific Publications II	2	W	6
8	TPF92005	Dissertation	5	W	6

### 4.2. Description of the Dissertation Course

#### TPF92001 QUALIFICATION

**1(1-0)**

Students prepare a pre-proposal containing the study material that will be used as research material. Qualification exams are carried out to assess students' readiness in theory, concept or technicality to conduct research on their dissertation. In this exam students must be able to demonstrate the feasibility of doing research independently to obtain a degree.

#### Course Learning Outcomes (CPMK):

1. Students are able to review literature and are relevant to the dissertation topic.
2. Students master scientific concepts related to the topic of their dissertation research.
3. Students are able to formulate research problems to be carried out.

#### TPF9202 DISSERTATION PROPOSAL

**2(2-0)**

Students must prepare a research proposal under the supervision of the promoter and co-promoter. The proposal is a research guideline for compiling a dissertation. Proposal writing can be started by students. The promoter and co-promoter provide direction and advice according to their competence so that the content of the research is worthy of a doctorate degree. This process requires intensive discussion with the promoter and co-promoter. Proposals must demonstrate the student's ability to conduct research independently and have good research qualities in order to obtain a doctorate degree. After the proposal is approved by the promoter and co-promoter, students must present it in front of the promoter, co-promoter, and examiner appointed by the head of the study program.

#### Course Learning Outcomes (CPMK):

1. Students are able to review the literature in depth and are relevant to the dissertation topic.
2. Students are able to identify, formulate and solve problems.
3. Students are able to plan and develop research methods for their dissertation research.

4. Students master state of art knowledge of the topic of their dissertation research.

#### **TPF91001 RESEARCH AND RESEARCH PROGRESS SEMINAR I      6(6-0)**

Research and research progress seminars have a weight of 18 credits which are divided into 3 stages of 6 credits each. This stage can be in accordance with the research stages in the dissertation proposal or not because the research stages are not in three stages. Students are required to arrange the material for this research progress seminar so that it can be divided into three stages. The division of these three stages is carried out so that the promoter can monitor the progress of research and the progress of writing scientific papers in journals on a regular basis. If the data obtained is still lacking, students can add material for the progress seminar from the results of a literature review with topics related to their research. Research progress seminar activities can be in the form of seminars held internally with the presence of promoters and co-promoters or students attending seminars, national or international scientific conferences or meetings. At the research results seminar, students must have submitted a draft publication based on the research data that has been obtained. If the research is still in progress, the publication draft does not have to be 100% complete for publication, the data that has been obtained and has been consulted with the promoter is discussed in the draft international scientific publication. Student participation in national or international seminars or scientific meetings must be approved by the promoter and co-promoter. Assessments for national and international scientific seminars are carried out by a team of supervisors. If the research is still in progress, the publication draft does not have to be 100% complete for publication, the data that has been obtained and has been consulted with the promoter is discussed in the draft international scientific publication. Student participation in national or international seminars or scientific meetings must be approved by the promoter and co-promoter. Assessments for national and international scientific seminars are carried out by a team of supervisors. If the research is still in progress, the publication draft does not have to be 100% complete for publication, the data that has been obtained and has been consulted with the promoter is discussed in the draft international scientific publication. Student participation in national or international seminars or scientific meetings must be approved by the promoter and co-promoter. Assessments for national and international scientific seminars are carried out by a team of supervisors.

#### **Course Learning Outcomes (CPMK):**

1. Students are able to do research independently
2. Students are able to analyze and synthesize data on the progress of research results
3. Students are able to communicate the progress of research results in writing and orally.

#### **TPF92003 RESEARCH AND RESEARCH PROGRESS SEMINAR II      6(6-0)**

Research and research progress seminars have a weight of 18 credits which are divided into 3 stages of 6 credits each. This stage can be in accordance with the research stages in the dissertation proposal or not because the research stages are not in three stages. Students are required to arrange the material for this research progress seminar so that it can be divided into three stages. The division of these three stages is carried out so that the promoter can monitor the progress of research and the progress of writing scientific papers in journals on a regular basis. If the data obtained is still lacking, students can add material for the progress seminar from the results of a literature review with topics related to their research. Research progress seminar activities can be in the form of seminars held internally with the presence of promoters and co-promoters or students attending seminars, national or international scientific conferences or meetings. At the research results seminar, students must have submitted a draft publication based on the research

data that has been obtained. If the research is still in progress, the publication draft does not have to be 100% complete for publication, the data that has been obtained and has been consulted with the promoter is discussed in the draft international scientific publication. Student participation in national or international seminars or scientific meetings must be approved by the promoter and co-promoter. Assessments for national and international scientific seminars are carried out by a team of supervisors. If the research is still in progress, the publication draft does not have to be 100% complete for publication, the data that has been obtained and has been consulted with the promoter is discussed in the draft international scientific publication. Student participation in national or international seminars or scientific meetings must be approved by the promoter and co-promoter. Assessments for national and international scientific seminars are carried out by a team of supervisors. If the research is still in progress, the publication draft does not have to be 100% complete for publication, the data that has been obtained and has been consulted with the promoter is discussed in the draft international scientific publication. Student participation in national or international seminars or scientific meetings must be approved by the promoter and co-promoter. Assessments for national and international scientific seminars are carried out by a team of supervisors.

**Course Learning Outcomes (CPMK):**

1. Students are able to do research independently
2. Students are able to analyze and synthesize data on the progress of research results
3. Students are able to communicate the progress of research results in writing and orally.

**TPF91002 RESEARCH AND RESEARCH PROGRESS SEMINAR III 6(6-0)**

Research and research progress seminars have a weight of 18 credits which are divided into 3 stages of 6 credits each. This stage can be in accordance with the research stages contained in the dissertation proposal or not because the research stages are not in three stages. Students are required to arrange the material for this research progress seminar so that it can be divided into three stages. The division of these three stages is carried out so that the promoter can monitor the progress of research and the progress of writing scientific papers in journals on a regular basis. If the data obtained is still lacking, students can add material for the progress seminar from the results of a literature review with topics related to their research. Research progress seminar activities can be in the form of seminars held internally with the presence of promoters and co-promoters or students attending seminars, national or international scientific conferences or meetings. At the research results seminar, students must have submitted a draft publication based on the research data that has been obtained. If the research is still in progress, the publication draft does not have to be 100% complete for publication, the data that has been obtained and has been consulted with the promoter is discussed in the draft international scientific publication. Student participation in national or international seminars or scientific meetings must be approved by the promoter and co-promoter. Assessments for national and international scientific seminars are carried out by a team of supervisors. If the research is still in progress, the publication draft does not have to be 100% complete for publication, the data that has been obtained and has been consulted with the promoter is discussed in the draft international scientific publication. Student participation in national or international seminars or scientific meetings must be approved by the promoter and co-promoter. Assessments for national and international scientific seminars are carried out by a team of supervisors. If the research is still in progress, the publication draft does not have to be 100% complete for publication, the data that has been obtained and has been consulted with the promoter is discussed in the draft international scientific publication.

Student participation in national or international seminars or scientific meetings must be approved by the promoter and co-promoter. Assessments for national and international scientific seminars are carried out by a team of supervisors.

**Course Learning Outcomes (CPMK):**

1. Students are able to do research independently
2. Students are able to analyze and synthesize data on the progress of research results
3. Students are able to communicate the progress of research results in writing and orally.

**TPF91003 INTERNATIONAL SCIENTIFIC PUBLICATION I**

**2(2-0)**

Students are required to publish scientific articles in reputable international journals. The intended international journal must be agreed with the promoter and co-promoter. According to the UB Chancellor's regulation no. 52 of 2018 that every Doctoral Program student is required to take and complete a final project in the form of a dissertation and scientific publication. Scientific publications in the form of: a) 2 (two) scientific articles in international Scientific Journals indexed by Scopus or Web of Science Core Collection (Thomson Reuter), having an impact factor of at least 0.1, or Microsoft Academic Search; or b). 1 (one) scientific article in a scientific journal as referred to in number 1 and 1 (one) article in the Proceedings. The final project in the form of Scientific Publication as referred to is prepared based on the results of the Dissertation research.

**Course Learning Outcomes (CPMK):**

1. Students are able to communicate concepts and research results clearly and effectively in reputable journals.
2. Students understand the procedure for submitting scientific manuscripts to reputable journals.

**TPF92004 INTERNATIONAL SCIENTIFIC PUBLICATION II**

**2(2-0)**

Students are required to publish scientific articles in reputable international journals. The intended international journal must be agreed with the promoter and co-promoter. According to the UB Chancellor's regulation no. 52 of 2018 that every Doctoral Program student is required to take and complete a final project in the form of a dissertation and scientific publication. Scientific publications in the form of: a) 2 (two) scientific articles in international Scientific Journals indexed by Scopus or Web of Science Core Collection (Thomson Reuter), having an impact factor of at least 0.1, or Microsoft Academic Search; or b). 1 (one) scientific article in a scientific journal as referred to in number 1 and 1 (one) article in the Proceedings. The final project in the form of Scientific Publication as referred to is prepared based on the results of the Dissertation research.

**Course Learning Outcomes (CPMK):**

1. Students are able to communicate concepts and research results clearly and effectively in reputable journals.
2. Students understand the procedure for submitting scientific manuscripts to reputable journals

**TPF92005 DISSERTATION EXAM**

**5(5-0)**

Students must be able to compile a dissertation manuscript properly and deserve to be tested in the final dissertation exam from the research results obtained. To be able to take the final dissertation exam, students are required to have at least 2 (two) scientific

publications from the results of the dissertation research that have been published or accepted for publication.

#### Course Learning Outcomes (CPMK):

1. Students are able to identify relevant theories and concepts and relate them to methodologies and evidence, apply appropriate techniques and draw conclusions systematically.
2. Students are able to compile research reports that have up-to-date topics in their fields
3. Students are able to interpret and apply information in the literature to explain the results of their research.
4. Students demonstrate the ability to make a real contribution to (new) knowledge through the results of their research.
5. Students are able to communicate concepts and research results clearly and effectively in scientific writing and orally.

#### 4.3. Dissertation Assessment

Assessment of dissertation courses is based on the time/semester in which the courses are programmed. The assessment of the dissertation courses is as follows:

No.	DISSERTATION COURSES				
1	TPF92001	<p>Qualification</p> <p>The value is in accordance with the value of the test results if it is carried out in semester 2. If you do not qualify, the semester 2 value will be E</p> <p>The value of E can change if the qualifying exam is held in the next semester but the score is not maximum</p> <p>Maximum value if executed on</p> <p>Semester 3 = B+</p> <p>Semester 4 = B</p> <p>Semester 5 = C+</p> <p>Semester 6 = C</p> <p>Semester 7 = D</p>	1	W	2
2	TPF9202	<p>Proposal Writing and Proposal Examination</p> <p>According to the test scores</p> <p>If you don't do the proposal exam, your score will be E</p> <p>The value of E can change if the proposal exam is carried out in the next semester but the score is not maximum</p> <p>Maximum value if executed on</p> <p>Semester 3 = B+</p> <p>Semester 4 = B</p> <p>Semester 5 = C+</p> <p>Semester 6 = C</p> <p>Semester 7 = D</p> <p>Examiners are given information on the position of students in what semester and the maximum score that can be obtained</p>	2	W	2
3	TPF91001	Research Progress Seminar I	6	W	3

No.	DISSERTATION COURSES				
		<p>Students are required to present their research results in an open seminar attended by other students, the supervisory team, and the head of the doctoral study program. This research progress seminar is scheduled in the lecture schedule</p> <p>Students present the results of their research, and if the data presented is still lacking, students can add the results of a review of the literature related to their research topic.</p> <p>The material for this Research Progress I Seminar can come from the results of Phase I Research or research results that have been obtained if the research stages are not divided into 3 stages.</p> <p>Students can replace this Research Progress I seminar with an oral presentation at a National or International Seminar with the approval of the supervisor in semester 3. The advisory team will provide an assessment of the National or International Seminar based on the assessment form.</p> <p>International seminars published in Scopus indexed proceedings can replace one of the scientific publications.</p>			
4	TPF92003	<p><b>Research Progress Seminar II</b></p> <p>Students present the results of their research, and if the data presented is still lacking, students can add the results of a review of the literature related to their research topic.</p> <p>The material for this Research Progress II Seminar can come from the results of Phase II Research or research results that have been obtained if the research stages are not divided into 3 stages.</p> <p>Students can replace this Research Progress II seminar with an oral presentation at a National or International Seminar with the approval of the supervisor in this 4th semester. The advisory team will provide an assessment of the National or International Seminar based on the assessment form.</p>	6	W	4

No.	DISSERTATION COURSES				
		International seminars published in Scopus indexed proceedings can replace one of the scientific publications.			
5	TPF91002	<p>International Scientific Publications I</p> <p>International publication writing I assessed by the Dissertation Quality Assurance Team</p> <p>The value of this scientific publication is in accordance with the results of the assessment</p> <p>If you do not publish, the score will be E. The publications that are assessed are publications that have been submitted to the journal and have been reviewed.</p> <p>The value of E can change if the publication is carried out in the next semester but the value is not maximum</p> <p>Maximum value</p> <p>Semester 6 = B+</p> <p>Semester 7 = B</p> <p>Semester 8 = C+</p> <p>Semester 9 = C</p> <p>Semester 10 = D</p>	2	W	5
6	TPF91003	<p>Research Progress Seminar III</p> <p>Students present the results of their research, and if the data presented is still lacking, students can add the results of a review of the literature related to their research topic.</p> <p>The material for this Research Progress III Seminar can come from the results of Phase III Research or research results that have been obtained if the research stages are not divided into 3 stages.</p> <p>Students can replace this Research Progress III seminar with an oral presentation at a National or International Seminar with the approval of the supervisor in this 5th semester. The advisory team will provide an assessment of the National or International Seminar based on the assessment form.</p> <p>International seminars published in Scopus indexed proceedings can replace one of the scientific publications.</p>	6	W	5
7	TPF92004	International Scientific Publications II	2	W	6

No.	DISSERTATION COURSES				
		<p>The writing of international publication II is assessed by the Dissertation Quality Assurance Team</p> <p>The value of this scientific publication is in accordance with the results of the assessment</p> <p>If you do not publish, the score will be E. The publications that are assessed are publications that have been submitted to the journal and have been reviewed.</p> <p>The value of E can change if the publication is carried out in the next semester but the value is not maximum</p> <p>Maximum value</p> <p>Semester 7 = B+</p> <p>Semester 8 = B</p> <p>Semester 9 = C+</p> <p>Semester 10 = C</p> <p>Semester 11 = D</p>			
8	TPF92005	<p>Dissertation Writing and Dissertation Examination</p> <p>According to the results of the assessment</p> <p>If you don't take the dissertation exam, your score will be E</p> <p>The value of E can change if the dissertation exam is held in the next semester but the score is not maximum</p> <p>Maximum value according to</p> <p>Semester 7 = B+</p> <p>Semester 8 = B</p> <p>Semester 9 = C+</p> <p>Semester 10 = C</p> <p>Semester 11 = D</p> <p>The requirement for this exam is that student publications have been accepted (accepted) in international journals and/or proceedings indexed by Scopus, and one more publication can be in an under review position.</p>	5	W	6



Appendix 1.8. Qualification Assessment Rubric

<b>CPMK</b>	<b>CPMK Description</b>	<b>CPMK Criteria</b>	<b>Related CPL (To be completed by Study Program)</b>	<b>Not enough &lt;55</b>	<b>Enough 55 - &lt;70</b>	<b>Good 70 - &lt;80</b>	<b>Very good 80 - 100</b>
<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>	<b>(8)</b>
CPMK 1	able to review literature	Review articles are well presented which are characterized by: 1. The background in Chapter 1 is presented in a sequence so that there is a common thread with the research problem to be carried out 2. Chapter 2 (library review) well presented 3. 80% of the referenced libraries are primary libraries/research results 75% of the referenced libraries are up-to-date (last 10 years)		The writings in chapters 1 and 2 are Malangly structured characterized by <50% of the criteria in column 3 being met	The writings in chapters 1 and 2 are quite well organized, characterized by 50-<75% of the criteria in column 3 being met	The writings in chapters 1 and 2 are well organized, characterized by 75-<100% of the criteria in column 3 being met	The writings in chapters 1 and 2 are very well organized, characterized by 75-<100% of the criteria in column 3 being met
CPMK 2	mastering related scientific concepts	The conceptual framework is presented with which is characterized by: 1. The conceptual framework is well presented		The writing in the conceptual framework is Malangly structured which is characterized by <50% of the	Conceptual framework writing is quite well prepared, which is characterized by 50-<75% of the criteria in column 3 being met	Conceptual framework writing is well prepared, characterized by 75-<100% of the criteria in column 3 being met	The concept framework writing is very well prepared, which is characterized by 75-<100% of the criteria in column 3 being met

		2. There is a clearly presented concept diagram		criteria in column 3 being met			
CPMK 3	able to formulate research problems	The problem formulation is very clear and well written which is characterized by: 1. The formulation of the problem to be studied is stated in clear sentences 2. The problems studied are up-to-date, there is no plagiarism or repetition 3. The benefits are well formulated and the benefits to society and science and technology are well illustrated		The writing in the problem formulation is Malangly structured which is characterized by <50% of the criteria in column 3 being met	The writing in the formulation of the problem is quite well prepared, which is characterized by 50-<75% of the criteria in column 3 being met	The writing in the formulation of the problem is well structured which is characterized by 75-<100% of the criteria in column 3 being met	The writing in the formulation of the problem is very well prepared, which is characterized by 75-<100% of the criteria in column 3 being met

Qualification script assessment form and mentoring

No.	Assessment criteria	Rating Description	%	Score	Number
CPMK 1	able to review literature	Review articles are well presented which are characterized by: 5. The background in Chapter 1 is presented in a sequence so that there is a common thread with the research problem to be carried out 6. Chapter 2 (library review) well presented 7. 80% of the referenced libraries are primary libraries/research results 8. 75% of referenced libraries are up to date (last 10 years)	20		

CPMK 2	mastering related scientific concepts	The conceptual framework is presented with which is characterized by: 3. the conceptual framework is well presented 4. there is a clearly presented concept diagram	20		
CPMK 3	Able to formulate research problems	The problem formulation is very clear and well written which is characterized by: 4. The formulation of the problem to be studied is stated in clear sentences 5. The problems studied are up-to-date, there is no plagiarism or repetition 6. The benefits are well formulated and the benefits to society and science and technology are well illustrated	10		
	Able to present the manuscript orally and defend it in front of the examiner	The ability of students to submit scientific arguments in answering questions	15		
		Mastery of scientific substance and ability to present novelty	15		
		Student reasoning ability in presentation	10		
		Scientific writing includes the ability to systematize and formulate problems	10		
Numerical Value (Amount)					
Quality Letters					

### Qualification Exam Assessment Form

No.	Evaluator	%	Score	Number
1.	Tester 1	25		
2.	Tester 2	25		
3.	Tester 3	25		
4	Promoter	25		
Amount				
Quality Letters				

Appendix 1.9. Dissertation Proposal Assessment Rubric

<b>CPMK</b>	<b>CPMK Description</b>	<b>CPMK Criteria</b>	<b>Related CPL (To be completed by Study Program)</b>	<b>Not good &lt;55</b>	<b>Enough 55 - &lt;70</b>	<b>Good 70 - &lt;80</b>	<b>Very good 80 - 100</b>
<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>	<b>(8)</b>
1	Students are able to review the literature in depth and are relevant to the dissertation topic.	able to review journals well so that the background is arranged, literature review that is in line with the topic of the dissertation		The writings in the draft proposal (Chapter 1 and Chapter 2) are Malangly structured, which is characterized by <50% of the criteria in column 3 being met	The writings in the draft proposal text (Chapter 1 and Chapter 2) are prepared quite well, which is characterized by 50-<75% of the criteria in column 3 being met	The writings in the draft proposal (Chapter 1 and Chapter 2) are well prepared, characterized by 75-<100% of the criteria in column 3 being met	The writings in the draft proposal (Chapter 1 and Chapter 2) are very well prepared which are characterized by 75-<100% of the criteria in column 3 being met
2	Students are able to identify, formulate and solve problems.	Able to make a problem formulation from the written background		The formulation of the problem is not clear and well written with characteristics of less than 50% meeting the very good and clear formulation of the problem as in column 3	The formulation of the problem is written quite clearly and quite well with the characteristics of meeting 50-<75% very good and clear problem formulation as in column 3	The problem formulation is written clearly and well with the characteristics of meeting 75-<100% very good and clear problem formulation as in column 3	The problem formulation is written very clearly and well with the characteristics of meeting 100% of the very good and clear problem formulation as in column 3
3	Students are able to plan and develop research methods	Very clearly and very well written framework and methods characterized by:		The framework and methods are written in a unclear and	The framework and methods are written quite clearly and quite	The framework and methods are clearly and well written which are	The framework and methods are written very clearly and very well

	for their dissertation research.	<ol style="list-style-type: none"> <li>1. It is clear that the background, problems and methods used in writing the flow of the framework are clearly described</li> <li>2. In the method, it is clear the stages and designs used, as well as the resulting outputs</li> <li>3. It is clear how the data analysis method will be used so that it is able to answer the dissertation problem</li> </ol>		Malang manner which is characterized by less than 50% of the criteria in column 3.	well, which is characterized by 50-<75% not meeting the criteria in column 3.	characterized by 75-<100% not meeting the criteria in column 3.	which is characterized by 100% non-fulfillment of the criteria in column 3.
4	Students master state of the art knowledge of research topics	<p>Excellent proposal presentation characterized by</p> <ol style="list-style-type: none"> <li>1. Mastery of state of art dissertation research</li> <li>2. Power point: in the form of points not sentences, interesting, aesthetic</li> <li>3. Presentation with appropriate voice intonation, not too fast or slow, not memorized, mastering the audience, mastering the material</li> <li>4. Correct and appropriate timing</li> </ol>		Malang proposal presentation characterized by less than 50% of the criteria in column 3 are met.	The presentation of the proposal is quite good, which is characterized by 50-<75% of the criteria in column 3 being met.	Good proposal presentation characterized by 75-<100% of the criteria in column 3 are met	The presentation of the proposal is very good, which is characterized by 100% of the criteria in column 3 being met

Dissertation Proposal Examination Assessment Form

No.	Assessment criteria	Rating Description	%	Score	Number
1	Scripting ability	Manuscripts are very clearly and very well written characterized by: 1. Relevant cited libraries 2. As many as 80% of the cited literature is primary/research results, not review literature 3. 75% of the literature cited is up to date (last 10 years) 4. Arranged systematically, deeply and coherently 5. Does not indicate plagiarism (10% plagiarism check) 6. Sentences are well structured, following the rules of PUEBI (General Indonesian Spelling Guidelines)	15		
2	Clarity of problem objectives and benefits	The problem formulation is very clear and well written which is characterized by: 1. The formulation of the problem to be studied is stated in clear sentences 2. Goals are clear and in line with the method 3. The benefits are well formulated and the benefits to society and science and technology are well illustrated	15		
3	3. Clarity of frame of mind 4. Clarity of research methods	Very clearly and very well written framework and methods characterized by: 1. It is clear that the background, problems and methods used in writing the flow of the framework are clearly described 2. In the method, it is clear the stages and designs used, as well as the resulting outputs 3. It is clear how the data analysis method will be used so that it is able to answer the dissertation problem	20		
4	Ability to present proposals orally and defend them	1. Power point: in the form of points not sentences, interesting, aesthetic 2. Presentation with appropriate voice intonation, not too fast or slow, not memorized, mastering the audience, mastering the material	5		

No.	Assessment criteria	Rating Description	%	Score	Number
		3. Correct and appropriate timing			
		The ability of students to submit scientific arguments in answering questions	15		
		Mastery of scientific substance and ability to present novelty	15		
		Student reasoning ability in presentation	15		
Amount (Number Value)					
Quality Letters					

### Proposal Examination Assessment Form

No.	Evaluator	%	Number	Mark
1.	Promoter	20		
2.	Co-promoter 1	16		
3.	Co-promoter 2	16		
4	Tester 1	16		
5	Tester 2	16		
6	Tester 3	16		
Amount				
Quality Letters				

# Appendix 1.10. Research Assessment Rubric and Research Progress Seminar I, II, III

		<b>Not enough &lt;55</b>	<b>Enough 55 &lt; NA &lt; 70</b>	<b>Good 70 &lt; NA &lt; 80</b>	<b>Very good 80 &lt; NA 100</b>
<b>1. Research competence (50%)</b>					
CPMK 1 Able to conduct research in the laboratory and in the field independently	1.1. Commitment and perseverance	Students have no motivation and run away from research and always give up	Students are always motivated but often do their research as an obligation. Sometimes distracted from work.	Students are motivated and able to solve their own problems with a little help from their supervisor.	Students are highly motivated, Strive to get the most out of their research. Able to control all matters relating to his research. Taking adversity as his motivation
	1.2. Initiative and creativity	Students have absolutely no motivation or ideas	Students get new initiatives and or ideas suggested from other people (supervisors), are not motivated to make choices	Students have the initiative to start discussions with new ideas with their supervisor and develop one or two ideas in the minor part of the research.	Research methods are innovative and or advanced analytical methods. Research problems are formulated scientifically by students
	1.3. independence	Students are only able to carry out research projects properly after repeating the instructions given and with direct assistance from their supervisors	Students often ask for instructions and assignments that must be explained by the supervisor in detail and the supervisor must check carefully to see if the student has done all the assignments.	Students choose and plan their assignments together with their supervisors and carry out their duties in their own way.	Students plan and carry out their obligations independently and are able to organize some assistance obtained independently
	1.4. Work efficiency in carrying out research	Students are unable to set and or execute research experiments	Students are able to execute detailed instructions on several things but often make some mistakes	Students are able executing an experiment that has been designed by someone else. By considering the sources of error and uncertainty qualitatively	Students are able to set up or modify experiments according to their needs to answer research objectives. Consider quantitatively sources of error and uncertainty. Execute experiments smoothly
	1.5. research skill development	Students' knowledge and insight is not enough and students are not able to handle it	Students are able to adopt some of the skills shown during mentoring	Students are able to adopt skills in accordance with those presented during mentoring and develop several skills independently	Students have broad scientific knowledge and insight. Students are able to explore problem solving with their abilities, improve their skills and knowledge if they feel they need it

		Not enough <55	Enough 55 < NA < 70	Good 70 < NA < 80	Very good 80 < NA 100
<b>2. Dissertation progress report (30%)</b>					
CPMK 2 Able to analyze and synthesize data on the progress of research results  CPMK 3 Able to communicate the progress of research results in writing and orally	2.1. Relevance of research, clarity of purpose, coherent explanation	There is no relationship between the research objectives and the topic. There is no explanation of the research context	The explanation of the context of the topic is too general, there is no relationship between what has been researched and what will be researched	Explanation of the research formulation is good. There is a relationship between context and research objectives	Research is positioned appropriately in the relevant field of science. Students are able to demonstrate novelty and research innovation
	2.2. The theoretical basis and use of literature	There is no discussion based on theory	Students find relevant theoretical foundations but the explanations are not in accordance with their research and show some errors	Students find relevant theoretical foundations, are able to make a synthesis and successfully adapt the discussion to existing research	The writing of the relevant theoretical foundation is clear, complete and coherent, up to date. Appropriately adapted to existing research
	2.3. use of methods and data	There is no explanation of the method and or research data	Some aspects concerning data collection, data treatment, model or method of analysis are not clear, so some parts cannot be reproduced	The explanation of the data (how to obtain, treatment etc.) and the method of analysis are lacking in some parts	Explanation of data (how to obtain, treatment, etc.) and analysis methods are complete and clear. Thus enabling the reproduction of research data
	2.4. Discussion	There is no discussion or reflection on his research. The discussion is only written in general. The discussion is not connected with the literature	Students are able to show most of the weaknesses in research but are unable to weigh the impact on the research results relative to each other	Students show differences in research results that are clearly visible and relate them to the literature. Students try to explain the added value of their research but do not relate it to existing research	Students critically confront the research results with the existing literature, if there are differences, they can weigh the results with the existing literature. Students are able to show the contribution of their work to the development of scientific concepts
	2.5. Clarity of conclusions and recommendations	There is no relationship between research objectives, results and conclusions	Conclusions answer the research objectives but not all research objectives. Some conclusions are not based on results or just repeat the results	The relationship between research objectives and conclusions is clear. All conclusions are based on results. Conclusions are formulated precisely and clearly.	The relationship between research objectives and conclusions is clear. Conclusion based on results. Conclusions are formulated precisely and thoroughly. Conclusions are

		<b>Not enough &lt;55</b>	<b>Enough 55 &lt; NA &lt; 70</b>	<b>Good 70 &lt; NA &lt; 80</b>	<b>Very good 80 &lt; NA 100</b>
					grouped logically
	2.6. Writing	LKD is not well structured. Explanation is not detailed.	The structure of the LKD does not match the main format, it is wrong in several places and the wrong placement of some topics The level of detail varies greatly between chapters, no information, irrelevant information)	DFS structure Most functions are clear and specific. The hierarchy of each chapter/sub chapter is mostly correct. The order of chapters/sub-chapters is mostly logical, there are only a few that are illogical. The level of detail is mostly good.	Good report structure: Each chapter has a specific and clear function. The hierarchy of each chapter/sub-chapter is correct. The sequence of each chapter / sub chapter is logical. All the information is in the right place. The level of detail in all the sections is good
3.2. Verbal presentation (20%)					
CPMK 3. Able to communicate the progress of research results in writing and orally	Verbal presentation	Students are not able to maintain LKD. Not mastering the content	Students are able to maintain the LKD, master most of the content written on the LKD, only a few are unable to explain what they are doing and why they are doing it.	Students are able to maintain LKD. Mastering the written content, not mastering beyond it (still relevant)	Students are able to maintain a very good LKD and are able to place the LKD in the context of the latest and practical scientific literature.
	Mastery of the field of science	Students do not master knowledge that is relevant to their research topic	Students understand knowledge that is relevant to their research topic at the text book level	Students understand knowledge that is relevant to their research topic, including the literature used in the LKD	Students master knowledge that is relevant to their research topic written in the discussion even outside the field (but still relevant)

Description: LKD: dissertation progress report

Advisory Team Assessment Form

Assessment criteria	Score (1-100)	Weight	Value Number x Weight
B. Research competence (50%)			
6. Commitment and persistence	.....		
7. Initiative and creativity	.....		
8. independence	.....		
9. Efficiency at work	.....		
10. Research skill development	.....		
<b>Research Competency Average</b>	.....	0.50	.....
B. Dissertation Progress Report 30%			
7. Research relevance, clarity of purpose	.....		
8. The theoretical basis and use of literature	.....		
9. Use of methods and data	.....		
10. Discussion	.....		
11. Clarity of conclusions and recommendations	.....		
12. Writing	.....		
<b>Dissertation Progress Report Average Score</b>	.....	0.30	.....
C, Presentation 20%			
3. Verbal presentation	.....		
1. Mastery of the field of science	.....		
<b>Presentation Average</b>	.....	0.20	.....
<b>Total Number Value</b>			.....
<b>Letter Value</b>			.....

Remarks: ..... : part that needs to be filled

# Rating Compilation

No.	Evaluator	Weight (%)	Number (1-100)	Weight x Number
1.	Promoter	40	.....	.....
2.	Co-promoter 1	30	.....	.....
3.	Co-promoter 2	30	.....	.....
Final Score				.....
Final Value				.....

### Appendix 1.11. Research Assessment Rubric and Research Progress Seminar through National/International Seminars

		<b>Not enough &lt;55</b>	<b>Enough 55 &lt; NA &lt; 70</b>	<b>Good 70 &lt; NA &lt; 80</b>	<b>Very good 80 &lt; NA 100</b>
<b>1. Research competence (50%)</b>					
CPMK 1 Able to conduct research in the laboratory and in the field independently	1.1. Commitment and perseverance	Students have no motivation and run away from research and always give up	Students are always motivated but often do their research as an obligation. Sometimes distracted from work.	Students are motivated and able to solve their own problems with a little help from their supervisor.	Students are highly motivated, Strive to get the most out of their research. Able to control all matters relating to his research. Taking adversity as his motivation
	1.2. Initiative and creativity	Students have absolutely no motivation or ideas	Students get new initiatives and or ideas suggested from other people (supervisors), are not motivated to make choices	Students have the initiative to start discussions with new ideas with their supervisor and develop one or two ideas in the minor part of the research.	Research methods are innovative and or advanced analytical methods. Research problems are formulated scientifically by students
	1.3. independence	Students are only able to carry out research projects properly after repeating the instructions given and with direct assistance from their supervisors	Students often ask for instructions and assignments that must be explained by the supervisor in detail and the supervisor must check carefully to see if the student has done all the assignments.	Students choose and plan their assignments together with their supervisors and carry out their duties in their own way.	Students plan and carry out their obligations independently and are able to organize some assistance obtained independently
	1.4. Work efficiency in carrying out research	Students are unable to set and or execute research experiments	Students are able to execute detailed instructions on several things but often make some mistakes	Students are able executing an experiment that has been designed by someone else. By considering the sources of error and uncertainty qualitatively	Students are able to set up or modify experiments according to their needs to answer research objectives. Consider quantitatively sources of error and uncertainty. Execute experiments smoothly
	1.5. research skill development	Students' knowledge and insight is not enough and students are not able to handle it	Students are able to adopt some of the skills shown during mentoring	Students are able to adopt skills in accordance with those presented during mentoring and develop	Students have broad scientific knowledge and insight. Students are able to explore

		Not enough <55	Enough 55 < NA < 70	Good 70 < NA < 80	Very good 80 < NA 100
				several skills independently	problem solving with their abilities, improve their skills and knowledge if they feel they need it
<b>2. Dissertation Progress Reports or Scientific Articles at National/International Seminars (30%)</b>					
CPMK 2 Able to analyze and synthesize data on the progress of research results  CPMK 3 Able to communicate the progress of research results in writing and orally	2.1. Relevance of research, clarity of purpose, coherent explanation	There is no relationship between the research objectives and the topic. There is no explanation of the research context	The explanation of the context of the topic is too general, there is no relationship between what has been researched and what will be researched	Explanation of the research formulation is good. There is a relationship between context and research objectives	Research is positioned appropriately in the relevant field of science. Students are able to demonstrate novelty and research innovation
	2.2. The theoretical basis and use of literature	There is no discussion based on theory	Students find relevant theoretical foundations but the explanations are not in accordance with their research and show some errors	Students find relevant theoretical foundations, are able to make a synthesis and successfully adapt the discussion to existing research	The writing of the relevant theoretical foundation is clear, complete and coherent, up to date. Appropriately adapted to existing research
	2.3. use of methods and data	There is no explanation of the method and or research data	Some aspects concerning data collection, data treatment, model or method of analysis are not clear, so some parts cannot be reproduced	The explanation of the data (how to obtain, treatment etc.) and the method of analysis are lacking in some parts	Explanation of data (how to obtain, treatment, etc.) and analysis methods are complete and clear. Thus enabling the reproduction of research data
	2.4. Discussion	There is no discussion or reflection on his research. The discussion is only written in general The discussion is not connected with the literature	Students are able to show most of the weaknesses in research but are unable to weigh the impact on the research results relative to each other	Students show differences in research results that are clearly visible and relate them to the literature. Students try to explain the added value of their research but do not relate it to existing research	Students critically confront the research results with the existing literature, if there are differences, they can weigh the results with the existing literature. Students are able to show the contribution of their work to the development of

		<b>Not enough &lt;55</b>	<b>Enough 55 &lt; NA &lt; 70</b>	<b>Good 70 &lt; NA &lt; 80</b>	<b>Very good 80 &lt; NA 100</b>
					scientific concepts
	2.5. Clarity of conclusions and recommendations	There is no relationship between research objectives, results and conclusions	Conclusions answer the research objectives but not all research objectives. Some conclusions are not based on results or just repeat the results	The relationship between research objectives and conclusions is clear. All conclusions are based on results. Conclusions are formulated precisely and clearly.	The relationship between research objectives and conclusions is clear. Conclusion based on results. Conclusions are formulated precisely and thoroughly. Conclusions are grouped logically
	2.6. Writing	Articles are not well structured. Explanation is not detailed.	The structure of the article does not match the main format, wrong in some places and misplaced some topics The level of detail varies greatly between chapters, no information, irrelevant information)	Article structure Most of the functions are clear and specific. The hierarchy of each section/subsection is mostly correct. The sequence of sections/subsections is mostly logical, there are only a few that are illogical. The level of detail is mostly good.	Good article structure: Each part has a specific and clear function. The hierarchy of each section/subsection is correct. The sequence of each section/subsection is logical. All the information is in the right place. The level of detail in all the sections is good
3.2. Verbal presentation (20%)					
CPMK 3. Able to communicate the progress of research results in writing and orally	Seminar quality assessment		National seminars, organized by reputable professional associations/PT/scientific institutions	Seminars/conferences International; There are keynote speakers from abroad;	Seminars/conferences International indexed on SCOPUS, IEEE Explore, SPIE; Minimum 3 Keynote speakers from abroad; Participants from various countries (>3 countries)

		<b>Not enough &lt;55</b>	<b>Enough 55 &lt; NA &lt; 70</b>	<b>Good 70 &lt; NA &lt; 80</b>	<b>Very good 80 &lt; NA 100</b>
	ppt quality	The organizational structure of the presentation is not clear. Unbalanced i.e. too much text and few graphics (graphs or tables) or vice versa.	Unstructured presentation. In some parts it is not clear. In some parts too much text and few graphics (graphs or tables) or vice versa	The organizational structure of the presentation is clear, Only in a few parts the use of text, tables and graphics is not balanced	The organizational structure of the presentation is clear and concise, to the point. The use of text, tables and graphics is clear.

Description:

Student participation in seminars must pay attention to: 1) The requirements for the type of seminar or conference that students may participate in are indexed or unindexed international conferences or national seminars organized by reputable professional associations/PT/scientific institutions. 2) presentation material is the result of student research 3) students present their paper orally

Advisory Team Assessment Form

Assessment criteria	Score (1-100)	Weight	Value Number x Weight
C. Research competence (50%)			
11. Commitment and persistence	.....		
12. Initiative and creativity	.....		
13. independence	.....		
14. Efficiency at work	.....		
15. Research skill development	.....		
<b>Research Competency Average</b>	.....	0.50	.....
B. Articles 30%			
13. Research relevance, clarity of purpose	.....		
14. The theoretical basis and use of literature	.....		
15. Use of methods and data	.....		
16. Discussion	.....		
17. Clarity of conclusions and recommendations	.....		
18. Writing	.....		
<b>Article Average</b>	.....	0.30	.....
C, Presentation 20%			
Seminar/conference quality assessment)	.....		
ppt quality	.....		
<b>Presentation</b>	.....	0.20	.....
<b>Total Number Value</b>			.....
<b>Letter Value</b>			.....

..... : the part that needs to be filled with value

# Rating Compilation

No.	Evaluator	Weight (%)	Number (1-100)	Weight x Number
1.	Promoter	40	.....	.....
2.	Co-promoter 1	30	.....	.....
3.	Co-promoter 2	30	.....	.....
Final Score				.....
Final Value				.....

Appendix 1.12. Rubric for Assessment of International Scientific Publications I and II

Sub-CPMK	Description of Sub CPMK	Assessment criteria	Not enough	Enough	Good	Very good
			Score 1	Score 2	Score 3	Score 4
1	<p>Able to determine journals/proceedings in accordance with the topic being researched and the depth of research</p> <p>Able to meet the requirements listed in the journal/proceeding guide</p>	<p>Journal publishing quality</p> <ol style="list-style-type: none"> <li>Continuously indexed on Scopus</li> <li>Publishing consistency</li> <li>The number of articles published in each edition is consistent</li> <li>Not indicated as predatory</li> <li>Quality of article layout</li> <li>Editing quality</li> <li>Review process</li> <li>SJR journal</li> </ol>	<ol style="list-style-type: none"> <li>Often discontinues on Scopus</li> <li>Inconsistent publishing</li> <li>The number of articles is inconsistent</li> <li>Including predatory journal</li> <li>Bad layout</li> <li>Bad editing</li> <li>No review process</li> <li>SJR less than 0.05</li> </ol>	<ol style="list-style-type: none"> <li>Several times discontinued on Scopus</li> <li>Publishing is rather consistent</li> <li>The number of articles is rather consistent</li> <li>Never been a predatory</li> <li>Layout is quite good</li> <li>Editing is enough</li> <li>Enough review process</li> <li>SJR 0.05 - &lt;0.1</li> </ol>	<ol style="list-style-type: none"> <li>Ever been a disco in Scopus</li> <li>Publishing is quite consistent</li> <li>The number of articles is quite consistent</li> <li>Not including predatory</li> <li>Layout is quite good</li> <li>Good editing</li> <li>Good review process</li> <li>SJR 0.1 - &lt; 0.15</li> </ol>	<ol style="list-style-type: none"> <li>Never discontinues on Scopus</li> <li>Consistent publishing</li> <li>Consistent number of articles</li> <li>Journal Q1, Q2, or Q3</li> <li>Very good layout</li> <li>Good editing</li> <li>Good review process</li> <li>SJR is greater than or equal to 0.15</li> </ol>
2	Able to compose Introduction	<ol style="list-style-type: none"> <li>Clarity/sharpness/urgency/problem formulation</li> <li>Appropriateness/clarity/sharpness of theoretical basis</li> <li>Past research/current supporting literature review</li> <li>novelty/novelty</li> <li>Clarity of research objectives</li> </ol>	<ol style="list-style-type: none"> <li>Urgency/problem formulation is not clear/not sharp</li> <li>Bad theory base is not appropriate/clear/sharp</li> <li>Previous research/supporting literature review is few and not up-to-date</li> <li>The novelty is bad or there are similarities with other research</li> <li>Research objectives are not clear</li> </ol>	<ol style="list-style-type: none"> <li>The urgency/problem formulation is quite clear/not sharp</li> <li>The theoretical basis is quite appropriate/clear/sharp</li> <li>Previous research/supporting literature review is sufficient and quite up-to-date</li> <li>The novelty is sufficient or there is no resemblance to other research</li> </ol>	<ol style="list-style-type: none"> <li>Urgency/problem formulation is clear/sharp</li> <li>The theoretical basis is appropriate/clear/sharp</li> <li>Previous research/supporting literature review is adequate and up-to-date</li> <li>The newness/novelty is good or there is no</li> </ol>	<ol style="list-style-type: none"> <li>The urgency/problem formulation is very clear/sharp</li> <li>The theoretical basis is very appropriate/clear/sharp</li> <li>Previous research/supporting literature review is very adequate and very up-to-date</li> <li>The novelty is very good or has no</li> </ol>

Sub-CPMK	Description of Sub CPMK	Assessment criteria	Not enough	Enough	Good	Very good
			Score 1	Score 2	Score 3	Score 4
				5. Research objectives are not clear	resemblance to other research	resemblance to other studies
3	Able to arrange method	1. Compatibility with problems 2. Clarity 3. Analysis update 4. The suitability of the data analysis used	1. Does not match the problem 2. Unclear 3. Analysis not up to date 4. The data analysis used is not appropriate	1. Sufficiently according to the problem 2. Quite clear 3. The analysis is quite up to date 4. The data analysis used is quite appropriate	1. According to the problem 2. Clear 3. Cutting-edge analysis 4. The data analysis used is appropriate	1. Very suitable for the problem 2. Very clear 3. Very up-to-date analysis 4. The data analysis used is very appropriate
4	Able to arrange Results and Discussion	1. Compatibility with problems and goals 2. Depth and sharpness of discussion 3. Updating supporting literature 4. Data interpretation 5. Comprehensive	1. Not in accordance with the problem and purpose 2. Not deep and not sharp 3. Supporting literature is not up to date 4. Improper interpretation of data 5. Not comprehensive	1. Sufficiently in accordance with the problem and purpose 2. Deep enough and sharp enough 3. Supporting literature is quite up-to-date 4. Data interpretation is rather precise 5. Quite comprehensive	1. In accordance with the problem and purpose 2. Deep and sharp 3. Up-to-date supporting literature 4. Precise data interpretation 5. Comprehensive	1. Very in accordance with the problem and purpose 2. Very deep and very sharp 3. Supporting literature is very up-to-date 4. Data interpretation is very precise 5. Comprehensive
5	Able to draw conclusions	1. Answering problems and goals 2. Do not repeat data 3. The generalization of the research results is well conveyed	1. Does not answer the problem and purpose 2. Repeat writing data 3. There is no generalization of research results	1. Enough to answer the problem and purpose 2. Part of the data rewritten 3. The generalization of the research results is written quite precisely	1. Answering problems and goals well 2. Only a small amount of data rewritten 3. Generalization of research results is written correctly	1. Answering problems and goals very well 2. Do not repeat data 3. Generalization of research results is written very precisely
6	Able to arrange Reference	1. Number of literature 2. No missing literature 3. Libraries	1. The amount of literature is inadequate/very little and what it is	1. The amount of literature is sufficient 2. Missing literature 25-50%	1. Sufficient amount of literature 2. Missing literature <25%	1. The amount of literature is very adequate

Sub-CPMK	Description of Sub CPMK	Assessment criteria	Not enough	Enough	Good	Very good
			Score 1	Score 2	Score 3	Score 4
		4. Library updates (< last 10 years) 5. Library relevance 6. Bibliography traceability (libraries can be searched online or there is a DOI or can be accessed internationally)	2. Missing literature is more than 50% 3. Primary library <25% 4. No up-to-date library 5. No relevant library 6. All libraries can not be searched	3. Primary library 25 - <50% 4. Up-to-date library <50% 5. The library is quite relevant 6. <50% library traceability	3. Primary library 50 - <75% 4. Up-to-date library 50- <75% 5. Relevant library 6. Library traceability 50 - <75%	2. Missing literature 25- 50% 3. Primary library 75- 100% 4. 75-100% up-to-date library 5. The library is very relevant 6. 75-100% library traceability
7	Able to compose Abstract	1. Abstract written interesting 2. Cover all the elements in the main article briefly	1. Abstract written unattractive 2. Does not cover all the elements in the main article briefly	1. Abstract written quite interesting 2. Covers some of the elements in the main article briefly	1. Abstract written interesting 2. Covers most of all the elements in the main article in a nutshell	1. Abstract written very interesting 2. Cover all the elements in the main article briefly
8.	Able to write in English	1. Spelling error 2. Grammar error 3. Punctuation error 4. English Quality	1. There are so many spelling errors 2. Too many grammar mistakes 3. There are so many punctuation errors 4. Very Malang quality of English	1. Many spelling errors 2. Lots of grammar mistakes 3. Many punctuation errors 4. Malang English quality	1. Moderate spelling error 2. Moderate grammar error 3. Medium punctuation error 4. Medium English Quality	1. Slight spelling error 2. Few grammar mistakes 3. Slight punctuation error 4. Good English quality
9.	Able to compile completeness of journals/proceedings /other requirements and delivery (assessed by Supervisor)	Completeness of the journal is fulfilled according to the journal/proceeding guidelines and the required conditions	Completeness of journals/proceedings and other requirements are met as is	Completeness of journals/proceedings and other requirements are met quite well	Completeness of journals/proceedings and other requirements are met properly	Completeness of journals/proceedings and other requirements are met very well

Sub-CPMK	Description of Sub CPMK	Assessment criteria	Not enough	Enough	Good	Very good
			Score 1	Score 2	Score 3	Score 4
10.	Able to make revisions (assessed by Supervisor)	Revisions were carried out well and reviews from reviewers were responded well	Revisions and responses are carried out less well / Malang	Revisions and responses were done quite well	Revision and response done well	Revisions and responses are very well done

## International Scientific Publication Assessment Form I and II

Student name :  
 NIM :  
 Study program :  
 Article Title :  
 Journal Name :  
 Vol, Edition, Year of publication :  
 Journal link :  
 SJR journal link :

Appraiser Name :  
 Position : Advisor/Dissertation Quality Assurance Team\*  
 Rating Date :  
 Signature :

\*Cross the unnecessary ones

Rating Points		Rating Score				Score Score	Weight
		1	2	3	4		
<b>A. Quality of Publishing Journals/Proceedings</b>							Value = .....
1	Continuously indexed on Scopus						15%
2	Publishing consistency						
3	The number of articles published in each edition is consistent						
4	Not indicated as predatory						
5	Quality of article layout						
6	Editing quality						
7	Review process						

8	SJR journal						
		Amount				.....	...../32 X 15%
B. Introduction							Value = .....
1	Clarity/sharpness/urgency/problem formulation						10%
2	Appropriateness/clarity/sharpness of theoretical basis						
3	Past research/current supporting literature review						
4	novelty/novelty						
5	Clarity of research objectives						
		Amount				.....	...../20 X 10%
C. Methods							Value = .....
1	Compatibility with problems						15
2	Clarity						
3	Analysis update						
4	The suitability of the data analysis used						
							...../16 X 15%
D. Results and Discussion							Value = .....
1	Compatibility with problems and goals						30%
2	Depth and sharpness of discussion						
3	Updating supporting literature						
4	Data interpretation						
5	Comprehensive						
		Amount				.....	...../20 X 30
E. Conclusion							Value = .....
1	Answering problems and goals						5%

2	Do not repeat data						
3	The generalization of the research results is well conveyed						
		Amount				.....	..... /9 X 5
<b>F. Reference</b>							
							Value = .....
1	Number of literature						10%
2	No missing literature						
3	Libraries						
4	Library updates (< last 10 years)						
5	Library relevance						
6	Bibliography traceability (libraries can be searched online or there is a DOI or can be accessed internationally)						
		Amount				.....	.../24 X 10
<b>G. Abstract</b>							
							Value = .....
1	Abstract written interesting						5%
2	Cover all the elements in the main article briefly						
		Amount					...../8 X 5
<b>H. Quality of English</b>							
							Value = .....
1	Spelling error						10%
2	Grammar error						
3	Punctuation error						
4	English Quality						
		Amount					.... /16 X 10
Total Value A+B+C+D+E+E+F+G+H							Letter Value:

**International Scientific Publication Guidance Assessment Form I and II**  
(Assessment by Supervisor)

Student name :  
 NIM :  
 Study program :  
 Article Title :  
 Journal Name :  
 Vol, Edition, Year of publication :  
 Journal link :  
 SJR journal link :  
 Appraiser Name :  
 Rating Date :  
 Signature :

Rating Points		Rating Score				Proportion	Mark
		1	2	3	4		
1	Completeness of the journal is fulfilled according to the journal/proceeding guidelines and the required conditions					20	
2	Revisions were carried out well and reviews from reviewers were responded well					30	
3	Seriousness in compiling journals					10	
4	Independence in compiling journals					10	
5	Difficulty level in publication					10	

6	Timeliness in preparing journals					10	
7	Intensity of mentoring					10	
		Total Value					
		Final Score = Total Score : 4					

Description:

1 = Bad, 2 = Fair, 3 = Good, 4 = Very good

### Compilation of Assessment of International Scientific Publications I and II

Student name :

NIM :

Study program :

Article Title :

Journal Name :

Vol, Edition, Year of publication :

Journal link :

SJR journal link :

No.	Evaluator	%	Number	Mark
1.	Rating Average (of all Assessors and Advisors)	80		
2.	Guidance			
	Promoter	10		
	Co-Promotor 1	5		
	Co-Promoter 2	5		
Amount				

Number of raters: 2 people



### Appendix 1.13. Dissertation Examination Assessment Rubric

		<b>Not enough &lt; 55</b>	<b>Enough 55 &lt; NA 70</b>	<b>Good 70 &lt; NA 80</b>	<b>Very good 80 &lt; NA 100</b>
<b>1. Originality and Recency (20%)</b>					
CPMK 4 . Students demonstrate the ability to make a real contribution to (new) knowledge through the results of their research	1.1.Originality and Recency	Make a small, unoriginal contribution using a cookbook approach, not very interesting but demonstrates the ability to do research	-Make sufficient contributions by answering relevant but small and outdated problems	Make an important contribution by solving problem solutions in new ways, answering problems in new ways but not completely	Making an interesting contribution is the main contribution, both in solving an old problem in a brilliant and innovative way as well as answering current problems
<b>2. Dissertation Writing (50%)</b>					
CPMK 1  Students are able to identify relevant theories and concepts and relate them to methodologies and evidence, apply appropriate techniques and draw conclusions systematically	2.1. Research relevance clarity of purpose,	There is no relationship between the research objectives and the topic. There is no explanation of the research context	The explanation of the context of the topic is too general, there is no relationship between what has been researched and what will be researched	Explanation of the research formulation is good. There is a relationship between context and research objectives	Research is positioned appropriately in the relevant field of science. Students are able to demonstrate novelty and research innovation
	2.2. The theoretical basis and use of literature	There is no discussion based on theory	Students find relevant theoretical foundations but the explanations are not in accordance with their research and show some errors	Students find relevant theoretical foundations, are able to make a synthesis and successfully adapt the discussion to existing research	The writing of the relevant theoretical foundation is clear, complete and coherent, up to date. Appropriately adapted to existing research

		<b>Not enough &lt; 55</b>	<b>Enough 55 &lt; NA 70</b>	<b>Good 70 &lt; NA 80</b>	<b>Very good 80 &lt; NA 100</b>
	2.3. use of methods and data processing	There is no explanation of the method and or research data	Some aspects concerning data collection, data treatment, model or method of analysis are not clear, so some parts cannot be reproduced	The explanation of the data (how to obtain, treatment etc.) and the method of analysis are lacking in some parts	Explanation of data (how to obtain, treatment, etc.) and analysis methods are complete and clear. Thus enabling the reproduction of research data
CPMK 3  Students are able to interpret and apply information in the literature to explain the results of their research	2.4. Discussion	There is no discussion or reflection on his research. The discussion is only written in general The discussion is not connected with the literature	Students are able to show most of the weaknesses in research but are unable to weigh the impact on the research results relative to each other	Students show differences in research results that are clearly visible and relate them to the literature. Students try to explain the added value of their research but do not relate it to existing research	Students critically confront the research results with the existing literature, if there are differences, they can weigh the results with the existing literature. Students are able to show the contribution of their work to the development of scientific concepts
	2.5. Clarity of conclusions and recommendations	There is no relationship between research objectives, results and conclusions	Conclusions answer the research objectives but not all research objectives. Some conclusions are not based on results or just repeat the results	The relationship between research objectives and conclusions is clear. All conclusions are based on results. Conclusions are formulated precisely and clearly.	The relationship between research objectives and conclusions is clear. Conclusion based on results. Conclusions are formulated precisely and thoroughly. Conclusions are grouped logically
CPMK 2	2.6. Writing	Dissertation is not well	The structure of the	Dissertation Structure Most	Good report structure:

		<b>Not enough &lt; 55</b>	<b>Enough 55 &lt; NA 70</b>	<b>Good 70 &lt; NA 80</b>	<b>Very good 80 &lt; NA 100</b>
Students are able to compile research reports that have up-to-date topics in their fields		structured. Explanation is not detailed.	dissertation is not in accordance with the main format, wrong in several places and misplaced in some topics The level of detail varies greatly between chapters, no information, irrelevant information)	of the functions are clear and specific. The hierarchy of each chapter/sub chapter is mostly correct. The order of chapters/sub-chapters is mostly logical, there are only a few that are illogical. The level of detail is mostly good.	Each chapter has a specific and clear function. The hierarchy of each chapter/sub-chapter is correct. The sequence of each chapter / sub chapter is logical. All the information is in the right place. The level of detail in all the sections is good
<b>3. Ability to defend dissertation and presentation (30%)</b>					
CPMK 5  Students are able to communicate concepts and research results clearly and effectively in scientific writing, dissertations and orally	3.1.Ability to defend dissertation	Students have difficulty in explaining knowledge that is relevant to their research topic	Students are able to defend the dissertation, master most of the content written in the dissertation, only a small part are unable to explain what they do and why they do it	Students are able to defend the dissertation. Mastering written content, not mastering beyond it (which is still relevant)	Students are able to defend the dissertation, and are able to show certain parts that are done better. Students are able to put the dissertation, in a scientific or practical context
	3.2 Mastery of the field of science	Students do not understand all the knowledge that is relevant to their research topic written in the dissertation,	Students understand knowledge that is relevant to their research topic at the text book level	Students understand knowledge that is relevant to their research topic including the literature used in the dissertation,	Students not only understand the knowledge that is relevant to the research topic written in the discussion but also

		<b>Not enough &lt; 55</b>	<b>Enough 55 &lt; NA 70</b>	<b>Good 70 &lt; NA 80</b>	<b>Very good 80 &lt; NA 100</b>
					understand the discussion of the topic under study with the literature
	3.3. Verbal presentation	Monotonous presentation and student reading from slides. Too much text and few graphics (graphs or tables) or vice versa.	Unstructured presentation in some parts is not clear. In some parts too much text and few graphics (graphs or tables) or vice versa	The presentation structure is clear, the presentation is monotonous in only a few parts. Only in a few parts the use of text, tables and graphics is not balanced	The presentation structure is clear and concise, to the point. Clear use of text, tables and graphics

### Advisory and Examiner Team Assessment Form

Assessment criteria	Score (1-100)	Weight	Value Number x Weight
A..Originality and Recency 20%	.....	0.20	.....
B. Dissertation Manuscript 50%			
19. Research relevance, clarity of purpose	.....		
20. The theoretical basis and use of literature	.....		
21. Use of methods and data processing	.....		
22. Discussion	.....		
23. Clarity of conclusions and recommendations	.....		
24. Writing	.....		
<b>Dissertation Writing Average</b>	.....	0.50	.....
C, Ability to defend dissertation and presentation 30%			
4. Ability to defend dissertation	.....		
5. Mastery of the field of science	.....		
6. Verbal presentation	.....		
<b>Average value</b> defend dissertation and Presentation	.....	0.30	.....
<b>Dissertation Exam Total Score</b>		1.0	.....

Description: Fill in the “.....”

### Compilation of Exam Assessment

No.	Evaluator	%	Number (1-100)	Mark
1.	Promoter	25		
2.	Co-promoter 1	15		
3.	Co-promoter 2	15		
4	Tester 1	15		
5	Tester 2	15		
6	Tester 3	15		
Amount				

One of the examiners from outside UB

Number of UB examiners: 2

Number of Examiners outside UB: 1

Guidance Form is made for all Promoter Team

1. Percentage of mentoring = 40
2. Test percentage = 60

### Compilation of scores from Exams and Guidance

No.	Evaluator	%	Number (1-100)	Mark
1.	Promoter	40		
2.	Co-promoter 1	30		
3.	Co-promoter 2	30		

**PART II**  
**DISSERTATION WRITING**

# CHAPTER 1. PARTS OF DISSERTATION

Scientific work is divided into three parts, namely: the beginning, the main part and the end.

The difference between a proposal and a dissertation

CHAPTER	PROPOSAL	CHAPTER	DISSERTATION
	COVER		COVER
	TITLE PAGE		TITLE PAGE
	VALIDITY SHEET		VALIDITY SHEET
	-		STATEMENT OF ORIGINALITY
	-		MOTTO
	-		allotment
	-		AUTHOR'S LIVE HISTORY
	-		THANK-YOU NOTE
	-		SUMMARY (ENGLISH)
	-		SUMMARY (ENGLISH)
	FOREWORD		FOREWORD
	LIST OF CONTENTS		LIST OF CONTENTS
	LIST OF TABLES		LIST OF TABLES
	LIST OF FIGURES		LIST OF FIGURES
	APPENDIX LIST		APPENDIX LIST
	-		SYMBOL LIST
	-		ABBREVIATION
	-		DEFINITION
Pig	INTRODUCTION	PIG	INTRODUCTION
chapter II	LITERATURE REVIEW	CHAPTER II	LITERATURE REVIEW
chapter III	RESEARCH METHODS	chapter III	RESEARCH METHODS
		Chapter IV	RESULTS AND DISCUSSION
		Chapter V	CONCLUSIONS AND SUGGESTIONS
	BIBLIOGRAPHY		BIBLIOGRAPHY
	ATTACHMENT		ATTACHMENT

## 1.1. The Beginning of Scientific Work

The initial part consists of:

Proposal

Title page cover

Endorsement page

Preface page

Contents page

Table list page

Image list page

Attachment list page

Initial part of the dissertation:

Title page cover

Endorsement page  
Originality statement page  
Designation page (not required)  
Curriculum Vitae page  
Thank you page  
Summary page (Indonesian)  
Summary page (English)  
Preface page  
Contents page  
Table list page  
Image list page Attachment list page

### **1.2. Main Part Scientific work**

**The main parts of the Dissertation Proposal consist of:**

Chapter I Introduction  
CHAPTER II Literature Review  
CHAPTER III Research Concept Framework  
CHAPTER IV Research Methods  
CHAPTER V Bibliography

**The main part of the Dissertation consists of:**

PIG introduction  
CHAPTER II Literature review  
CHAPTER III Research Concept Framework  
CHAPTER IV Research Methods  
CHAPTER V Results and Discussion  
CHAPTER VI Conclusions and Suggestions  
Bibliography  
Attachment.

### **1.3. Final Part of Scientific Work**

The final part of the scientific dissertation contains attachments, if needed.

## **CHAPTER 2. THE BEGINNING OF SCIENTIFIC WORK**

### **2.1. Cover**

The outer cover of the dissertation is black. On the cover is printed: the title of the dissertation, the words: dissertation (capital letters), the words: To Fulfill the Requirements for Obtaining a Doctoral Degree, the name of the study program, the symbol of Universitas Brawijaya, the full name of the author (without a degree), the student identification number, the text: Doctoral Program Faculty of Agricultural Technology Universitas Brawijaya Malang, and the year the dissertation was submitted (Sample cover see Appendix 1). The cover consists of two parts: a hard cover and an inner white HVS paper. On the back of the cover the author's name, dissertation title and year of graduation are listed. How to write a spine, an example of a front cover for typing on a spine, see Appendix 2.

### **2.2. Title page**

The title page of the scientific paper contains the same writing as the cover page, but is printed on white paper. The title of the research should be short and specific, and clearly provide an overview of the research being planned. Examples of research titles:

- 1) Potential Polyherbal Jabung (PHJ) containing Turi seeds (*Sesbania grandiflora*), Earring roots (*Acalypha indica*) and Salak leaves (*Salacca Zalacca*) as Antidiabetic with multitarget mechanism
- 2) Cyanide Detoxification of Bitter Cassava (*Manihot esculenta* Crantz) by Submerged and Solid Spontaneous Fermentation Methods and Back-Slopping Fermentation and Base Soaking

### **2.3. Approval/Approval Page**

The ratification/approval page contains the title of the scientific paper, the name of the author and the words of ratification, the composition of the board of examiners and the signature of the board of examiners in the order of chairman of the supervisory commission, members of the supervisory commission.

### **2.4. Test Team Identity Page**

The identity page of the Examining Team is printed on white HVS paper, containing the title of the dissertation, student identity, the name of the Advisory Commission or Promoter Commission, and the name of the Examining Lecturer Team.

### **2.5. Statement of Dissertation Originality**

Statement of originality is the author's statement and guarantee for the authenticity of the dissertation he wrote and is accompanied by a Plagiarism Free Certificate from the Graduate Program of Universitas Brawijaya.

### **2.6. Designation Page**

The designation page is not a mandatory page to be held. On this page, personal matters are written, among others, for whom the dissertation or dissertation is presented. An example of the designation page is in Appendix 6.

### **2.7. Summary Page**

The summary is written in two languages: Indonesian and English. Because it is a translation between the two versions, the sentences between the two must be the same. The title of the summary is the same as the title of the scientific paper, typed in capital letters on a new page. The title of the summary or summary is placed at the top of the page. The summary includes the research problem, research objectives, research methods and salient research results. In the summary there should be no quotations

(references) from the literature, so it is the result of writing/pure descriptions of the author. The contents of the summary must be understandable without having to look back at the material of the scientific paper. The summary is compiled with a total of 600-800 words (1.5 - 2 pages) and typed 1 space. The bottom part of the summary is added with at least 5 keywords.

## **2.8. Foreword Page**

The preface contains a brief description of the process of writing a scientific paper, thanks and there should be no scientific description. An example of an introductory page is in Appendix 9.

## **2.9. Table of Contents Halaman**

The table of contents page is typed on a new page and given the title of the table of contents typed in capital letters without ending with a period and placed in the middle of the paper. The table of contents contains a list of tables, a list of pictures, titles of chapters and sub-chapters, bibliography and appendices. Information that precedes the table of contents does not need to be included in the table of contents. The title of the chapter is typed in capital letters, while the title of the sub-chapter is typed in lowercase except for the first letter of each sub-chapter, which is typed in capital letters. Neither the chapter title nor the sub-chapter ends with a period. Chapter numbers use Roman numerals and sub chapters use Arabic numerals. The typing distance between the title lines of one chapter and another is two spaces, while the space between the chapters is one space.

## **2.10. Tables Page**

The table list page is typed on a new page. The title of the table list is typed in capital letters without ending with a period and is placed in the center of the paper. The table list contains all the tables presented in the text and appendices. Table numbers are written with numbers. The spacing of table titles (text) that is more than one line is typed one space and the distance between table titles is two spaces. The table title in the table list page must match the table title in the text.

## **2.11. Image List Page**

The image list page is typed on a new page. The image list page contains a list of images, image numbers, image titles and page numbers, both images in the text and in the Appendix. How to type on the image list page like on the table list page.

## **2.12. Attachment List Page**

Attachment list page is typed on a new page. The title of the attachment list is typed in the top center of the page in capital letters. The attachment list page contains the attachment and page title text numbers. The title of the attachment list must be the same as the title of the attachment. The appendix contains examples of calculations, variances, maps and data. An example of an attachment list page is in Appendix 13.

## **2.13. List of Symbols and Abbreviations Halaman**

The symbol and abbreviation list page contains symbols/quantity and abbreviations of terms/units. The Symbol list section does not need to be present all the time. The typing method is as follows:

- The first row/column contains abbreviations.
- There is a second row/column containing abbreviations presented in the first column.
- The abbreviations are written in the Latin alphabet, with uppercase letters followed by lowercase letters.
- If the symbol is written in Greek letters, the writing is also based on the Greek alphabet.
- The information in the second column is typed in lowercase, except for the first letter in capital letters.

## **CHAPTER 3.**

### **MAIN PART OF SCIENTIFIC WORK**

The main part of the Scientific Work consists of several chapters. The number of chapters is not standardized, but adjusted to the scope of the research. The main sections generally consist of: Introduction, Literature Review / Theoretical Framework / Framework for Thinking, Conceptual Framework, Research Methods, Results and Discussion, Conclusions and Suggestions, and Bibliography. The series of words to convey the information presented in a scientific paper should be thorough, brief, solid, clear, sharp, relevant and consistent.

Basically the form of dissertation writing has standard rules in each chapter, both the number of chapters and the rules for the content of each chapter.

#### **3.1. CHAPTER I INTRODUCTION**

This introductory chapter contains, among others: background, problem formulation, research objectives and research benefits.

##### **a) Research Background**

Outlining the facts relevant to the research problem as a starting point for formulating the research problem, the reasons (empirical, technical) why the problems raised in the research proposal are considered important for research.

##### **b) Formulation of the problem**

Research stems from a question from a problem that arises from the researcher. The formulation of the problem contains the process of simplifying the problem to make it easier for problems that can be researched or formulating the relation of the scientific or technological knowledge gap to be studied with a wider scientific knowledge gap. The formulation of the problem is not always in the form of a question sentence. More specific research questions or problems will be better because they can direct more specific research activities as well.

Problem study which good should meet some condition:

- 1) Relevant to the time of occurrence of the problem,
- 2) Regarding practical problems,
- 3) Can fill the "research gap",
- 4) Allows generalization,
- 5) Having sharpness in the definition of the main concepts, can improve research methods for future researchers.

#### **Example 1. Research Problem Formulation**

- 1). Can the administration of fermented or unfermented Moringa leaf extract by *Lactobacillus plantarum* increase the immune response of mice infected with *Salmonella typhi*?
- 2). What is the role of bitter melon extract (*Momordica charantia*) on blood sugar and insulin levels in diabetics?

##### **c) Research purposes**

The formulation of the research objectives is a short and clear statement. Research can aim to explore, describe, explain, prove or apply a symptom, concept, or assumption or create a prototype. Research objectives must specify the objectives to be achieved in

the research. In some terms, the research objectives should also be implied in the research title. With logic like point (b) above, if the formulation of the problem is stated in the form of a question, The number of questions does not always have to be the same as the research objectives.

**d) Benefits of research.**

This section states the relationship between the research results formulated in the research objectives and the problem of wider gaps or the real world that is complicated and complex.

### **3.2. CHAPTER II LITERATURE REVIEW**

The position of the literature review is placed after the formulation of the problem, the objectives and benefits of the research so that the library materials presented in the guided literature review are directed. The library used should be the latest, relevant and original, for example scientific articles. Explain clearly the literature review that generates ideas and underlies the research carried out. The literature review describes the theory, findings and other research materials obtained from reference literature, which are used as the basis for conducting research. The description in the literature review is directed to develop a framework or concept that will be used in research. Literature review refers to the Bibliography.

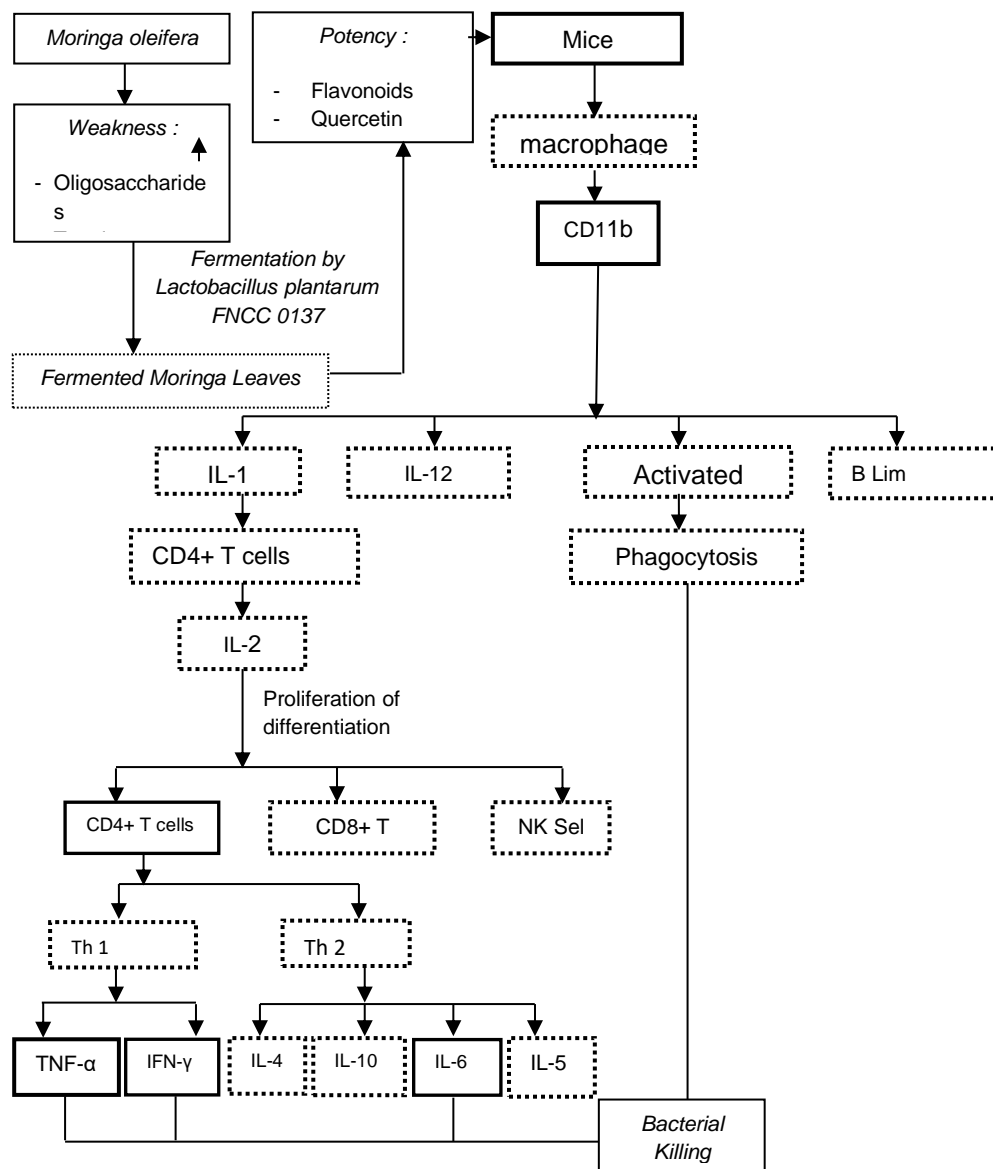
The position of the literature review is placed after the presentation of the formulation of the problem, the purpose and use of the research, so that the library materials presented in the literature review are integrated and directed. This chapter presents the results of the study or study of theory or elements of theory (concepts, propositions, etc.) or the results of previous studies that are relevant to the problems and research objectives in a systematic and analytical manner. This chapter does not merely contain quotations or inclusion of theories, concepts, propositions and paradigms, in a row and coherent manner taken from various sources (cut and paste), but is the result of a mixture of the process of comparison, comparison and dialogue between theories, concepts, propositions. , the existing paradigm (starting from the classic to the latest) which the researchers then drew the common thread.

Sources of literature can come from Scientific Journals, text book citations may be relevant as long as they are. Lecture instructions, practicum guides and lecture materials can be used as library materials, as long as the original work of the author concerned.

### **3.3. CHAPTER III RESEARCH CONCEPT FRAMEWORK**

This chapter can be provided if needed. Concept is basically an understanding or understanding of a phenomenon which is a basic element of the thinking process. The research concept framework usually includes: (a) framework of thought, (b) hypo, and (c) operational definition and measurement of variables.

This conceptual framework can be a summary of the literature review that supports or rejects the theory around the research problem. It also describes the gaps between the results of previous studies, so they need to be investigated. The description of the conceptual framework or framework usually leads to hypo and can be arranged in the form of a flow chart. The following is an example of a conceptual framework.



**Figure 2. Example** Thinking Framework (Laili, 2017)

### 3.4. CHAPTER IV RESEARCH METHOD

The method used in the research must be described in detail. The description may include the variables in the research, the model used, the research design, data collection and data analysis techniques, how to interpret the research results. For research that uses qualitative methods, it can be explained the approach used, the process of collecting and analyzing information, the process of interpreting and inferring the results of the research.

#### a. Place and time of research

The place of research is clearly described regarding research activities in the field or in the laboratory. The description of the location of the field research may include administrative areas (village, sub-district, district or province), institutions, universities or experimental gardens belonging to the Research Institute. Can also be mentioned soil type, climate. If the research activity is carried out in a laboratory, the name of the

laboratory and the institution shall be written.

Research time is described in terms of month, year, season (if necessary) research activities are carried out starting from preparation to the end of research implementation

#### **b. Materials and tools**

The research material is explained by the specifications of the material or research material, including the origin of the sample, the method of sample preparation, the age of the sample (if any), physical properties, and chemicals used (Brand and Country).

The tools used are also described in full specifications, so that the validity of the research can be known based on the measuring instrument. In addition, other researchers who want to re-test the research do not experience errors.

#### **c. Research methods**

The research procedure is displayed in full and in detail about the steps that have been taken in the implementation of the research and is described in the form of a research flow chart. The experimental stages are shown in the form of a flow chart and explained in full in the form of paragraphs for each experimental stage.

#### **d. Variable observation**

Describe the types of variables that will be observed/measured during the study. Data collection method which contains methods and procedures/how to obtain data, either chemically, physically, organoleptically or biologically. Statistical and/or mathematical data analysis methods and models

### **3.5. CHAPTER V RESULTS AND DISCUSSION**

Research results are usually combined in one chapter, namely Results and Discussion, but this is not a requirement. Research results do not have to be contained in one chapter only, but can be divided into several chapters according to need, thus the form of presentation has two versions, namely:

1. The results and discussion are described in one chapter that is not separated, but the results and discussion as sub-chapters and each sub-heading are divided into several sub-headings. At the end of the discussion, a special sub-chapter is often presented, namely a general discussion.
2. The results and discussion are described in several chapters as needed. Giving a name for each chapter is adjusted to the content of the subject.

Presentation of research results or observations can be in the form of text, tables, pictures, graphics and photos. The results of research or observations can contain the main data, supporting and complementary data needed to strengthen the results of research or observations, if needed can use the results of statistical tests. Narratives in the results of research or observations contain a review of the meaning contained in tables, pictures and others. The results of research or observations in the form of tables or pictures or graphs are not to be discussed, but their meaning is conveyed Discussion is the giving of meaning and reasons why the data obtained in such a way and a good description of the discussion from the researcher concerned must be presented, which can be strengthened, contradicted or in accordance with the results of other people's research. Reviews of these reasons can be in the form of theoretical explanations, either qualitatively, quantitatively or statistically. In this case what is important is the review of why this happened, it could even be that the findings are completely new (never been found). In the discussion, it is often also reviewed why a hypothesis is rejected or accepted. An important thing to note in giving a review is that it is comprehensive and does not go out of the context stated in the research objectives so that the flow of discussion feels consistent with the title.

### **3.6. CHAPTER VI CONCLUSIONS AND SUGGESTIONS**

At the end of a dissertation, conclusions and suggestions must be presented. Conclusions should be presented separately from suggestions.

#### **1) Conclusion**

Conclusions are: (a) brief and accurate statements based on the results of the discussion (b) answers to research problems and as far as possible must be in accordance with the research objectives.

#### **2) Suggestions**

Suggestions are the experiences and considerations of the authors for: (a) researchers in similar fields who wish to conduct further research (b) practical policies (c) improvement of methods.

## CHAPTER 4. HOW TO WRITE A DISSERTATION

### 4.1. Title Writing

- Indonesian title: all capital letters except for the Latin name (eg species name) written in italics with a capital letter in the first word)
- English title: italicized, capitalized at the beginning of words except for conjunctions such as and, of, after, before, or, at, on, for, toward, off etc.

### 4.2. Table Writing

- The table is made open (without borders on the right and left of the table cover)
- The table title is written in capital letters at the beginning of the sentence, without ending with a period
- Headings in table columns are capitalized at the beginning of each word except conjunctions
- The title in the table row is capitalized at the beginning of each word except for conjunctions
- Fonts* in the table is Arial 11
- Fonts* for descriptions written with Arial 11
- Statistical notation that follows the numbers in the table is written in lowercase and separated by spaces

Example of writing a table for 2 columns:

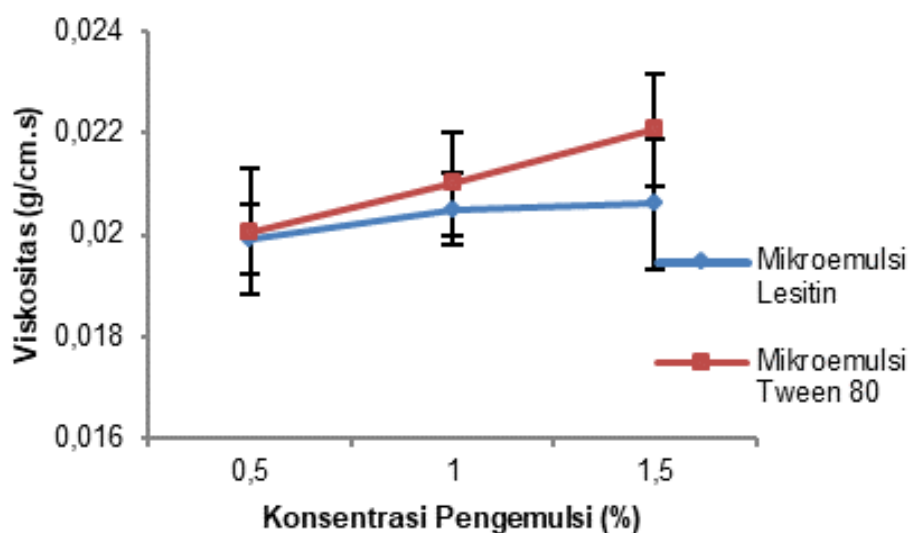
Table 9. Example Table Characteristics of palm oil fatty acid distillate (DALMS) and unsaponifiable fraction (FTT)

Characteristics	DALMS	FTT
Free fatty acid content (%)	80.74 $\pm$ 0.49	4.06 $\pm$ 0.70
Peroxide number (mec/kg)	4.74 $\pm$ 0.78	3.31 $\pm$ 0.35
Anisidin number	2.79 $\pm$ 0.67	2.32 $\pm$ 0.20
yield		2.17 $\pm$ 0.39

### 4.3. Image Writing

- All images must be referenced in the text. Images and illustrations must use high resolution and good contrast in JPEG, PDF or TIFF format. The minimum resolution for photos is 300 dpi (dots per inch), while for graphics and line art it is 600 dpi. Black and white images must be created in grayscale mode, while color images must be in RGB mode. Images are made to be 80 mm (one column), 125 mm (one and a half columns), or 166 mm (two columns) wide.
- Image is rendered open (no border)
- The title of the image is written in capital letters at the beginning of the sentence, without ending with a period
- The text in the image is written in Arial 11 font.

Example image (1.5 columns)



**Figure 3.** Example of Microemulsion Viscosity Curve at various types and concentrations of emulsifiers

#### 4.4 Writing Units

- Units are written separately from the leading digits except for %. For example 100 m, 10°C, 86%
- Writing units refers to International Units (SI)

Table 10. Physical quantities of the SI system and their units

Quantity	Sub quantity	Unit	Symbol
Base	Long	meters	m
	Mass	grams, kilograms	g, kg
	Time	seconds (seconds)	s
	Electric current	Ampere	A
	Light intensity	candela	CD
Derivative	Large	square meter	m <sup>2</sup>
	Speed	meters per second	ms <sup>-1</sup>
	Power	watt	W
	Pressure	Pascal	Pa
	electrical charge	coulomb	C
	electric potential difference	volt	V
	electrical resistance	ohm	Ω
	illuminance	lux	lx
	Frequency	hertz	Hz
	Force	newtons	N
	Style	cubic meter *	m <sup>3</sup> or L
	Volume		

\*can be written in liters with the symbol L

The units for multiplication and division are written by separating the two units using a slash.

Table 11. Units in Indonesian and unit abbreviations in the form of multiplication and division

Unit	Unit writing
millimeters per day	mm/day
kilograms of P <sub>2</sub> O <sub>5</sub> per hectare	kg P <sub>2</sub> O <sub>5</sub> /ha
milligrams per gram per hour	mg/g/hour
grams per second	g/sec or g/s

#### 4.5. Number Writing

- Numbers are written using Arabic numerals (0, 1, 2, 3, 4, 5, 6, 7, 8, and 9) and are written according to the following rules:
- The decimal sign for Arabic numerals is written with a comma. Example 10.26 kg. The number of decimal places is two digits after the comma.
- The thousands sign for Arabic numerals is written with a period. Example 10,000 kg, 1,000,000 m
- Numbers are written as words if they are at the beginning of a sentence. Example: "Fifty million people suffer from hunger", not "50 million people suffer from hunger"
- Numbers followed by units are separated from their units using a space, unless they are followed by percent (%). Example: 100g instead of 100g; 50 °C, not 50°C or 50°C; 80% instead of 80%
- High-ranking numbers can be written using times signs (lower x) separated by spaces. Example: 2,573 x 10<sup>6</sup>, not 2-S7g.10<sup>6</sup> or 2,573 X 10<sup>6</sup>
- The numbers indicating the range are separated by a hyphen (-) without spaces and the units are written after the last number. Example: 5-10 cm instead of 5-10 cm or 5 cm \_ 10 cm
- Numbers indicating dimensions are written using a times sign (x) separated by spaces and units are written following each number. Example: 5 cm x 5 cm instead of 5 x 5 cm or 5 x 5 cm
- Numerals are written with the prefix 'ke' with a hyphen (\_). Example: 21<sup>st</sup> century
- Numbers representing large integers can be partially spelled for easy reading. Example: The protein content in Anjasmoro soybean is 28.96%.

#### 4.6. Tap and Text Spacing

- Each sentence is separated by a single tap.
- After the comma, the next word is separated by one tap
- The first sentence in a paragraph is indented inside the text by a distance of 0.8 inches.
- There are no spaces between paragraphs

#### 4.7. Conjunctions

Conjunctions are not placed at the beginning of the sentence.  
Examples of conjunctions: while, and, or, so that

## **CHAPTER 5.**

### **DISSERTATION TYPING FORMAT**

#### **5.1. Paper Material and Size**

The draft dissertation report is made using HVS paper measuring A4 (21 x 29.7 cm) weighing 80 g/m<sup>2</sup> (HVS 80 GSM), must not be typed back and forth and bound in the form of a light green hardcover and black writing. .

#### **5.2. Edge Border**

Typing limits are set as follows:

- a. Left edge : 3 cm
- b. Top, bottom and right edge: 2.5 cm

#### **5.3. Font type**

- a. Typed script using Arial 11 pt font.
- b. Italics or other special letters can be used for certain purposes, for example to mark foreign terms.
- c. Signs that cannot be typed must be neatly written in black ink.

#### **5.4. Line Spacing**

- a. In general, the distance between 2 lines is 1.5 spaces.
- b. The distance between the chapter title and the first sub-chapter title, or with the first sentence, is about 2 cm (2 x 2 spaces)
- c. If the sub-chapter titles are typed in descending order, the distance between the titles of one sub-chapter and the next sub-chapter is set by 2 spaces.
- d. The distance between the sub-chapter title and the first line of the sentence is 2 spaces.
- e. The distance between the end of the sentence from one sub-chapter with the title of the next sub-chapter is 3 spaces.
- f. The distance between the line of the sentence with the title of the table, or between the end of the table with the sentence (text) 3 spaces.
- g. The distance between the last line of the table/figure title and the table is 1.5 spaces, while the distance between the lines in the table/figure title is one space. The distance between the table/figure and its description is 1 space. However, the distance between the table/figure and/or its description with the text is 3 spaces.
- h. The formula is typed with the spacing as needed.

#### **5.5. Writing chapter titles and sub-chapters**

Each chapter starts on a new page, and the title is typed in capital letters in the middle of the page and is given a Roman number (I., II., III. etc.) ending with a full stop. The title of the sub-chapter is typed at the edge of the paragraph, numbered by the sub-chapter using Arabic numerals, for example 2.1, ending with a period. Likewise for the sub-chapter titles. The beginning of each word in the title of the sub-chapter and sub-sub-chapter is written in capital letters and the rest in lowercase letters.

#### **5.6. New paragraph**

In each new paragraph, the first word is 1 cm from the edge of the paragraph. There are no spaces between paragraphs.

#### **5.7. Room filling**

The space on the manuscript page must be filled in completely, meaning that typing must start from the left border to the right edge and no space is wasted except for new

paragraphs, equations, lists, pictures, titles or special things. In typing with word processing software, paragraph settings are often used automatically using the "justified" mode. In certain cases the distance between words becomes unequal and creates a large enough void between one word and the next. To avoid this, typing is allowed to decide on words, in accordance with good and correct Indonesian rules. The name of something (person, institution, etc.) in writing should not be cut off.

### 5.8. Table Typing Format

- a. Tables are lined with upper and lower borders without side borders (open table form) as exemplified in Table 4.1.
- b. Table numbers are typed in Arial font size 11 bold (bold). The table number is typed with 2 Arabic numerals separated by a period. The first number indicates the number of the chapter where the figure is located, while the second number indicates the serial number of the table or figure in the chapter.

Table 12. Example Table Characteristics of palm oil fatty acid distillate (DALMS) and unsaponifiable fraction (FTT)

Characteristics	DALMS	FTT
Free fatty acid content (%)	80.74 $\pm$ 0.49	4.06 $\pm$ 0.70
Peroxide number (mec/kg)	4.74 $\pm$ 0.78	3.31 $\pm$ 0.35
Anisidin number	2.79 $\pm$ 0.67	2.32 $\pm$ 0.20
yield		2.17 $\pm$ 0.39

- c. The table title is typed in Arial font size 11 left and right aligned (Justify). The title is written succinctly, but describes the content. Table title is typed 1 space without ending with a period and every word in it begins with a capital letter, except for conjunctions, prepositions and adverbs of place.
- d. Table numbers and titles are aligned to the left.
- e. The distance between the table title number and the table top line is 1 space. While the distance between rows of table titles is 1 space if the table title is more than 1 row.
- f. The title of the table must be the same as the title of the table or figure listed on the table list page.
- g. Table contents are typed with Arial font size 10 bold (bold) for column headings and not bold for column contents.
- h. Lines between rows are 1 space apart. The important thing is that the table is easy to read.
- i. The table is placed on the page of the manuscript in such a way that the border does not exceed the limit of the paper that can be printed and the table is centered in it.
- j. Table columns can be placed parallel to the width of the paper or parallel to the length of the paper (landscape). If the table columns can be placed parallel to the length of the paper (landscape), we recommend that the entire page be filled with tables without script text.
- k. The table may be placed in the middle of the page between the lines of the main body text.
- l. Table description, can be used to clarify the contents of the table.
- m. Tables and figures quoted from other sources are explained by including the author's name and year.
- n. Tables that require paper that are larger than the manuscript page are acceptable, but only tables that when folded once have reached the size of the manuscript page are included in the main body text. Larger tables are placed in the appendix.

### 5.9. Image Typing Format

- a. The term drawing includes drawings, illustrations, graphs, diagrams, floor plans, maps, charts, monograms, flow charts and portraits.

- b. Letters, numbers and other punctuation marks used in pictures must be clear.
- c. All images must be referenced in the text.
- d. Images and illustrations must use high resolution and good contrast in JPEG, PDF or TIFF format. The minimum resolution for photos is 300 dpi (dots per inch), while for graphics and line art it is 600 dpi.
- e. Black and white images must be created in grayscale mode, while color images must be in RGB mode.
- f. The image is made open without the image border.
- g. The image is placed symmetrically (centered) on the border of the paper that can be printed.
- h. The longest side of the image border can be placed parallel to the width of the paper or parallel to the length of the paper. For the last thing, the image should be made on a separate page without text to make it easier to read.
- i. The image with the longest side parallel to the width of the paper may be placed in the center of the page between lines of text.
- j. The image number is typed in Arial font size 11 bold (bold). The image number is typed with 2 Arabic numerals separated by a period. The first number indicates the number of the chapter where the image is located, while the second number indicates the serial number of the image in the chapter.
- k. The title of the image is typed in Arial font size 11 centered. The title is written succinctly, but describes the content. Image title typed 1 space without ending with a period and every word in it begins with a capital letter, except for conjunctions, prepositions and adverbs of place.
- l. The number and title of the image are placed 2 spaces below the bottom line of the image with a distance between lines of 1 space if the image title is more than 1 line.
- m. Images that require a page that is wider than the manuscript page are acceptable. Images that require 1 fold to reach the manuscript page size can be included in the body of the text. Images larger than that should be included in the appendix.

#### **5.10. Page Numbering**

- a. Pages in the introduction, table of contents, list of tables, list of figures are numbered with Roman numerals
- b. The main body page numbers are in Arabic numerals.
- c. Page numbers are placed symmetrically (centered) below the manuscript.
- d. The appendix page number is a continuation of the main body page number.

#### **5.11. Printing**

- a. The dissertation report is printed as needed, namely a number of supervisors and dissertation examiners and can be reproduced with photocopies for other purposes.
- b. The dissertation report is printed using a black ink printer for writing and/or color for images.

## **CHAPTER 6.**

### **HOW TO WRITE Citation AND LIBRARY**

#### **6.1. Bibliography Citing and Writing Bibliography**

- a. The bibliography contains the sources cited in the final project manuscript. The bibliography is written 1 space with the second line and so on indented as far as 1 cm. Between libraries are spaced 1 space.

Example:

McClements DJ, Zou L, Zhang R, Salvia-Trujillo L, Kumosani T, Xiao. 2015 H. Enhancing nutraceutical performance using excipient foods: designing food structures and processes to increase bioavailability. *Comprehensive Reviews in Food Science and Food Safety* 14: 824-847. DOI: 10.1111/1541-4337.12170

Tadros TF. 2013. Emulsion formation, stability, and rheology. In Tadros TF (ed), *Emulsion Formation and Stability*. 1st ed. Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim.

Zhang Z, Wang X, Liu C, Li J. 2016. The degradation, antioxidant and antimutagenic activity of the mucilage polysaccharide from *Dioscorea oppositifolia*. *Carbohydrate Polymers* 150(5): 227-231. <https://doi.org/10.1016/j.carbpol.2016.05.034>.

- b. Authors more than 2 people are written only the first author's name by adding et al. Example: Jurak et al. (2019) if it is placed at the beginning of the sentence or (Jurak et al., 2019) if it is placed at the end of the sentence.
- c. If there are 2 authors in 1 book or 1 reference source, then the writing uses the conjunction "and". Example: Cho and Jones (2019) if placed at the beginning of the sentence or (Cho and Jones, 2019) if placed at the end of the sentence.
- d. The author's name can be written at the beginning, in the middle or at the end of a sentence (text) depending on the arrangement.
- e. Especially for quoting tables and figures (non-text) from a library, the name of the author and the year of publication of the library are listed at the bottom of the table and after the last sentence of the title of the figure.
- f. If the same author publishes two or more libraries in the same year, then the citation is to add the letters a, b, c and so on (the letters don't need to be in Superscript) in the order they appear in the final manuscript, after the year of writing, for example Vendruscolo (2016a), (Yao and McClements, 2015b).
- g. The way of citing the opinion of authors listed in other literature follows the following example: Li et al. (2015) in Ang et al. (2019) suggested that ..... or ... Phospholipids are often used in the food, pharmaceutical, and cosmetic industries as emulsifiers, antioxidants, and drug carriers for the encapsulation of bioactive compounds (Li et al., 2015 in Ang et al., 2019).

#### **6.2. Bibliography Writing**

- a. Arranged in alphabetical order by author's name and year of publication. If there are 2 books that are referenced written by the same person but published in different years, the name of the author of the book is written again for each library.
- b. The first author's name starts with the last/surname/family name, followed by the first and second names (if any). Example:
  - Basuki Abdullah written: Abdullah B
  - Seno Sastroamidjojo written: Sastroamidjojo S
  - Sutan Takdir Alisyahbana is written: Alisyahbana ST
  - I Nyoman Suwandi Pendit written: Pendit INS

- c. Bachelor degrees, such as Prof., Dr., Ir., dr., Drs., SH., B.Sc., MA, M.Sc., and others in the bibliography do not need to be included.
- d. If there is more than one author, all authors' names are listed. Cannot be summarized as et al. or et al.
- e. If there are two authors, in both citations the names are written using conjunctions and for example Cho and Jones(2019), even though the library sources are in foreign languages.
- f. Library sources from Indonesian or Indonesian, if more than two, then cite using et al. (not et al). For example Purnomo et al. (2018) or Lestar et al., (2019).
- g. The year of publication is coded a, b, c, d.....etc if the same author is published in the same year. Code writing is based on the order of citations in the script.
- h. Journal names are abbreviated with standard abbreviations followed by writing volume, number, and pages.
- i. The title of the book is written in capital letters for each word except for conjunctions (style title case) and is written in italics, and the title of the manuscript of the journal is written in capital letters on the first word (style sentence case).
- j. The names of journals, magazines, or newsletters are not abbreviated.
- k. Example of writing a bibliography according to its type

### 6.3. Writing Source Library

The writing of the bibliography in the Bibliography depends on each type of library with the following details:

#### 1. *Libraries in the form of Periodic Scientific Magazines (Journals/Bulletins)*

##### How to write:

Author's name, year of publication, title of article/writing, name of magazine/journal, volume and magazine number and page number of article/writing followed by digital object identifier if any

##### Example:

McClements DJ, Zou L, Zhang R, Salvia-Trujillo L, Kumosani T, Xiao H. 2015. Enhancing nutraceutical performance using excipient foods: designing food structures and processes to increase bioavailability. *Comprehensive Reviews in Food Science and Food Safety* 14: 824-847. DOI: 10.1111/1541-4337.12170

Zhang Z, Wang X, Liu C, Li J. 2016. The degradation, antioxidant and antimutagenic activity of the mucilage polysaccharide from *Dioscorea opposita*. *Carbohydrate Polymers* 150(5): 227-231. <https://doi.org/10.1016/j.carbpol.2016.05.034>.

#### 2. *Library in the form of Textbooks*

##### How to write:

Name of author, year of publication, title of book, edition number (if not the first edition), name of publisher and place of publisher (name of region/city).

##### Example:

McClements DJ. 2015. *Food Emulsions: Principles, Practices, and Techniques*. 3rd ed. CRC Press, Boca Raton, Florida.

#### 3. *Chapters in Books*

##### How to write:

Name of author, year of publication, title of chapter, name of editor, title of book, edition number (if not the first edition), name of publisher and place of publisher (name of region/city).

##### Example:

Tadros TF. 2013. Emulsion formation, stability, and rheology. In Tadros TF (ed), Emulsion Formation and Stability. 1st ed. Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim.

#### **4. Thesis, Thesis, Dissertation**

##### How to write:

Name of author, year of publication, title of chapter, name of editor, title of book, edition number (if not the first edition), name of publisher and place of publisher (name of region/city).

##### Example:

Zahra AM. 2016. Characteristics of Lampung Silica Sand Waterglass with Smelting Sodium Hydroxide Base and Its Application in Postharvest Handling of Tomato (*Solanum lycopersicum*). Essay. Department of Agricultural Product Technology, Faculty of Agricultural Technology, Universitas Brawijaya.

Erning YI. 2019. Detoxification of Bitter Cassava Cyanide (*Manihot esculenta* Crantz) by Submerged and Solid Spontaneous Fermentation Methods and Back-Slopping Fermentation and Base Immersion. Dissertation. Doctoral Program in Agricultural Sciences, Faculty of Agriculture, Universitas Brawijaya.

#### **5. Internet**

##### How to write:

Author name, year, title, page, date of access.

##### Example:

Research and Markets. 2019. Global Rice Bran Oil Markets, 2011-2018 & 2019-2024. <https://www.globenewswire.com>. Access date July 8, 2019.

#### **6. Patent**

##### How to write:

Author's name, year, patent title, patent number.

##### Example:

Torgersen TL, Klaveness J, Myrset AH. 2012. Antioxidants in fish oil powder and tablets. US Patent 2012O156296A1.

#### **7. Proceedings**

##### How to write:

Author's name, year, article title, proceedings followed by the name of the seminar, place, date of the seminar.

##### Example:

Estiasih T, Harijono, Ahmadi K. 2017. Increasing production capacity, improving packaging, and implementing a quality system in small and medium businesses for instant herbal drinks for export market expansion. Proceedings of the National Seminar on the Communication Forum of Indonesian Agricultural Technology Universities (FKPTTPI). Kendari, 17 September.

Estiasih T, Aggriani R, Maligan JM. 2016. Protein composition and functional properties of protein concentrate from selected soybean (*Glycine max*) superior varieties. Proceedings of the International Conference on Food Properties (ICFP). Bangkok, Thailand, May 31-June 2.

#### **6.4. Etc**

The Indonesian language that must be used in the Final Project follows the rules of using Standard and Correct Indonesian according to the Enhanced Spelling (EYD). Grammatical rules must be adhered to by compiling complete and complete sentences. Use punctuation marks as necessary so that the clause can be distinguished from its main clause. It is recommended to use clauses carefully so that the sentence in question does not lose its subject. Passive sentences are more commonly used in scientific writing.

Personal pronouns, especially first person pronouns (I, we), should not be used in textual sentences, except in quotations. Cutting words into syllables must follow the correct conditions. The last word in the last line of a sentence on a page should not be truncated. If a paragraph must be broken due to a page change, then the last paragraph on the page must have a minimum of two lines remaining. Similarly, the section that is moved on the next page is a minimum of two lines. Use the enhanced Indonesian Spelling General Guidelines, General Guidelines for the Formation of Terms, and the General Indonesian Dictionary as a guide.

## **ATTACHMENT**

Appendix 2.1. Example of a Dissertation Proposal Cover

**CYANIDE DETOXIFICATION OF WOOD YAM (*Manihot esculenta* Crantz)  
BITTER USING SPONTANEOUS AND SOLID FERMENTATION METHODS  
AND BACK-SLOPPING FERMENTATION AND BASE IMMEDIATE Immersion**

**DISSERTATION PROPOSAL**



**By:**

**Y. ERNING INDRAstuti  
NIM 137040100111010**

**DOCTORAL PROGRAM OF FOOD SCIENCE  
FACULTY OF AGRICULTURE  
UNIVERSITAS BRAWIJAYA  
MALANG  
2019**

**CYANIDE DETOXIFICATION OF WOOD YAM (*Manihot esculenta* Crantz)  
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FACULTY OF AGRICULTURE  
UNIVERSITAS BRAWIJAYA  
MALANG  
2019**

# DISSERTATION PROPOSAL

**SUPERVISOR COMMISSION IDENTITY**

DISSERTATION TITLE: **CYANIDE DETOXIFICATION OF WOOD YAM (*Manihot esculenta* Crantz) BITTER USING SPONTANEOUS AND SOLID FERMENTATION METHODS AND BACK-SLOPPING FERMENTATION AND BASE IMMEDIATE Immersion**

Student name : Y. Erning Indrastuti  
NIM : 137040100111010  
Study program : Agricultural Science  
Interest : Agricultural Product Technology

## ADVISING COMMISSION

Promoter	:	Prof. Dr. Ir. Harijono, M.App.Sc.
Co-Promoter	:	Prof. Dr. Teti Estiasih, STP., MP.
Co-Promoter	:	Prof. Dr. Ir. Elok Zubaidah, MP.

**CYANIDE DETOXIFICATION OF WOOD YAM (*Manihot esculenta* Crantz)  
BITTER USING SPONTANEOUS AND SOLID FERMENTATION METHODS  
AND BACK-SLOPPING FERMENTATION AND BASE IMMEDIATE Immersion**

**DISSERTATION**



**By:**

**Y. ERNING INDRAstuti  
NIM 137040100111010**


**DOCTORAL PROGRAM OF FOOD SCIENCE  
FACULTY OF AGRICULTURE  
UNIVERSITAS BRAWIJAYA  
MALANG  
2019**

**DETOKSIFIKASI SIANIDA UBI KAYU (*Manihot esculenta* Crantz) PAHIT  
DENGAN METODE FERMENTASI SPONTAN TERENDAM DAN PADAT  
SERTA FERMENTASI *BACK-SLOPPING* DAN PERENDAMAN BASA**

**DISERTASI**

Untuk Memenuhi Persyaratan  
Memperoleh Gelar Doktor

4 cm



3 cm

Oleh:

**Y. ERNING INDRASTUTI  
NIM 137040100111010**

**PROGRAM DOKTOR ILMU PANGAN  
FAKULTAS PERTANIAN  
UNIVERSITAS BRAWIJAYA  
MALANG  
2019**

3 cm

# DISSERTATION

RESEARCH TITLE

By

Student name

has been defended in front of the examiner  
on .....  
and declared to have met the requirements

**Advisory Commission,**

Name  
Promoter

Name  
Co-Promoter 1

Name  
Co-Promoter 2

Malang,.....  
Head of program.....  
Faculty of Agricultural Technology  
Universitas Brawijaya

Name  
NIP .....

## DISSERTATION

### IDENTITY OF THE DISSERTATION EXAMINATION TEAM

#### DISSERTATION TITLE:

CYANIDE DETOXIFICATION OF WOOD (*Manihot esculenta* Crantz) BITTER  
USING SPONTANEOUS AND SOLID FERMENTATION METHODS AS WELL  
AS BACK-SLOPPING FERMENTATION AND BASE IMMEDIATE Immersion

Student name : .....  
NIM : .....  
Study program : .....

#### ADVISING COMMISSION

Chairman (Promoter) : .....  
Member (Co Promoter) : .....  
Member (Co Promoter) : .....

#### TEACHER TEACHER TEAM

Examiner 1 : .....  
Examiner 2 : .....  
Examiner 3 : .....

**Exam Date** : .....  
**SK** : .....

Publication of research results in international journals

1. ....
2. ....

## attachment 2.8. Sample Statement of Originality

### **STATEMENT DISSERTATION ORIGINALITY**

I solemnly declare that to the best of my knowledge, there is no scientific work that has been submitted by another person to obtain an academic degree at a university, and no work or opinion has been written or published by another person and to the best of my knowledge. mentioned in citation sources and literature

If it turns out that in this dissertation manuscript it can be proven that there are elements of plagiarism, I am willing to have this dissertation aborted and the academic degree that I have obtained (DOKTOR) is canceled, and processed in accordance with the applicable laws and regulations. (Law NO. 20 of 2003, Article 25 paragraph 2 and Article 70)

Malang, September 2019

**Student**

Stamp Rp. 6000  
signed

Name : .....  
NIM : .....  
PS : .....

## **MOTTO AND APPLICATIONS**

.....

This dissertation is dedicated to: .....

## AUTHOR'S LIVE HISTORY

Name : .....  
 Place and date of birth : .....  
 Address : .....  
 Institution : .....  
 Office address : .....  
 E-mail : .....

### Education

S1 ....., year..... (Essay: .....)  
 S2 ....., year..... (Thesis: .....)  
 S3 ..... years..... (Dissertation: .....)

### Work experience

Year ... to .....  
 Year.....

### Research experience

No	Year	Research Title and Source of Funds

### Scientific Publication Experience

#### SCIENTIFIC ARTICLE WRITING THE LAST 5 YEARS

No	Year	Scientific Article Title	Journal

SUBMISSION OF PAPERS AT SCIENTIFIC SEMINARS FOR THE LAST 5 YEARS

No	Scientific Article Title	Name of Seminar Time and Place

## THANK-YOU NOTE

A big thank you goes to:

1.....

**DISSERTATION.** Y. Erning Indrastuti, Cyanide Detoxification of Bitter Cassava (*Manihot esculenta* Crantz) Using Spontaneous and Solid Submerged Fermentation Methods and Back-Slopping Fermentation and Base Soaking. Promoter: Prof. Ir. Harijono, M.App.Sc.; Co-Promoter: Prof. Dr. Teti Estiasih, STP, MP; Co-Promoter: Prof. Dr. Ir. Elok Zubaidah, MP

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## SUMMARY

Cassava (*Manihot esculenta* Crantz) as a food ingredient has limitations, namely it has a low shelf life and the presence of cyanogenic glycoside toxins, if more than 100 ppm it tastes bitter. Several varieties of cassava which have high productivity and starch content but taste bitter are Malang 4, Malang 6 and Sembung, so they are only used as industrial raw materials. The bitter taste of cassava is largely due to the cyanogenic glycosides linamarin ( $\pm 90\%$ ) and lotaustralin ( $\pm 10\%$ ). Cyanogenic glycosides are toxins where chronic exposure to cyanogenic glycosides causes Tropical Ataxic Neuropathy (neurological syndrome), exacerbating iodine deficiency, namely goiter and cretinism, while acute cyanogenic glycoside poisoning can cause convulsions (paralysis) and death.

The submerged and solid fermentation process has been shown to reduce cyanide but the fermentation causes a low pH which inhibits the reduction of cyanide so that the cyanide residue in flour, especially linamarin and acetone cyanohydrin, is still high. Another problem with spontaneous fermentation, although it is easy and cheap, but takes a long time, uncontrollable and unstable results. The use of selected starter cultures can overcome this problem but is still considered expensive and less adaptive for traditional farmers, so a process is needed that reduces the shortcomings of spontaneous fermentation methods and starter cultures, namely the back-slopping fermentation process. Efforts to increase the pH after fermentation must be carried out either by solid fermentation or by immersion in calcium hydroxide solution.

Phase I research aims to: 1) analyze the decrease in cyanide of cassava varieties Malang 4, Malang 5 and Sembung due to microbial activity and dissolution in submerged fermentation for 72 hours; 2) analyze the relationship between increasing pH in solid fermentation for 0, 24, 48, and 72 hours and decreasing cyanide levels; 3) analyze the effect of submerged and solid fermentation on a series of grating processes, submerged fermentation, solid fermentation and drying ("Gadungan pohung") on the characteristics of grated cassava and cassava flour; 4) selecting the duration of solid fermentation of the "Gadungan Pohung" process series on high cassava which resulted in the highest cyanide reduction; 5) identify Lactic Acid Bacteria (LAB) which play a role in cyanide reduction during solid fermentation. Phase II aims to: 1) chose the spontaneous submerged fermentation method and back-slopping which resulted in a faster reduction of cassava cyanide. The water used in the back-slopping method is the fermented water submerged for 72 hours to which new water is added in a ratio of 1:4. Phase III aims to: 1) analyze the increase in pH after back slopping submerged fermentation and a decrease in cassava cyanide levels, especially acetone cyanohydrin and 2) analyze the series of grating processes, submerged fermentation, immersion in calcium hydroxide solution (0; 0.1; 0.2 and 0.3%) for 1, 2, 3, 4 and 5 hours and drying affects the characteristics of cassava flour; 3) comparing the detoxification process of "fake pohung" and a series of submerged fermentation processes and immersion of calcium hydroxide; explain the mechanism of cyanide reduction in the detoxification process.

The results of the first phase of the study showed that the cyanide reduction in cassava varieties Malang 4, Malang 6 and Sembung was  $66.53 \pm 0.05\%$ , respectively;  $69.15 \pm 0.40\%$ ;  $38.68 \pm 38.68\%$  after 72 hours of submerged fermentation and after drying there was a greater decrease in cyanide, namely Malang 4; Malang 6; Sembung were  $89.62 \pm 0.34\%$ , respectively;  $91.46 \pm 0.26\%$ ;  $82.74 \pm 0.64\%$ . When continued with solid

fermentation, there was a greater decrease in cyanide in addition to microbial activity as well as an increase in pH. Solid fermentation for 72 hours reduced cyanide in Malang 4, Malang 6 and Sembung by  $93.43 \pm 0.19\%$ , respectively;  $92.56 \pm 0.28\%$ ;  $90.12 \pm 0.37\%$  and after drying the cyanide decrease was greater. Detoxification with the series "Gadungan Pohung" produces cassava flour with cyanide content in Malang 4 varieties, Malang 6 and Sembung respectively 7.75 ppm, 9.17 ppm; 10.82 ppm. LAB that play a role in the reduction of cyanide during solid fermentation are *Lactobacillus plantarum* and *Leuconostoc fallax*. The process of "Fake Pohung" changes chemical components, functional and amylographic properties, digestibility of starch and morphology of starch granules.

The results of the second stage of the research showed that the cyanide levels of back-slopping fermentation for 48 hours were not significantly different from that of spontaneous fermentation for 60 hours so that cyanide was reduced faster, this was due to the larger total microbial population. The results of the third stage of the study obtained that the pH rose during plmmersion in calcium hydroxide after submerged fermentation provides optimal conditions for the degradation of linamarin and acetone cyanohydrin to free HCN. The combination of submerged fermentation and immersion in calcium hydroxide proved to be effective in reducing cyanide in less time than the "Gadungan Pohung" process. Detoxification with a series of grating processes, back-slopping submerged fermentation, immersion in 0.2% calcium hydroxide for 5 hours and drying can reduce cyanide by 97.74% and produce cassava flour with cyanide content of 8.04 ppm. Detoxification with a series of grating processes, submerged fermentation, soaking in calcium hydroxide and drying in addition to lowering cyanide, causes changes in chemical components, functional properties, amylography, digestibility of starch and morphology of starch granules.

Keywords: linamarin, acetone cyanohydrin, free HCN, fermented, calcium hydroxide

**DISSERTATION.** Y. Erning Indrastuti, **Detoxification of Cyanide in Bitter Cassava (*Manihot esculenta* Crantz) by Spontaneous Submerged and Solid Fermentation and Back-Slopping Fermentation and Alkaline Soaking Method.** Promoter: Prof. Ir. Harijono, M. App.Sc., Co-Promoter: Prof. Dr. Teti Estiasih, STP. MP., Co-Promoter: Prof. Dr. Ir. Elok Zubaidah, MP

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## SUMMARY

Cassava (*Manihot esculenta* Crantz) as food has limitations such as low shelf life and the presence of cyanogenic glycosides. Cassava has a bitter taste if it contains cyanogenic glycosides more than 100 ppm. Some cassava varieties which have high productivity and starch content but bitter taste are Malang 4, Malang 6 and Sembung, hence they are only used as industrial raw materials. The bitter taste of cassava is very largely due to linamarin ( $\pm 90\%$ ) and lotaustralin ( $\pm 10\%$ ). Cyanogenic glycosides produce the toxic compound that is hydrogen cyanide (HCN). Cyanogenic glycosides are poisonous where chronic cyanogenic glycoside exposure causes Tropical Ataxic Neuropathy (neurological syndrome), aggravating goiter, and cretinism; whereas acute cyanogenic glycosides can cause konzo (paralysis), and death.

Submerged and solid substrate fermentation processes have been shown to reduce cyanide but the fermentation results in a decrease in pH that inhibits further reduction of cyanide, causing high residual levels of cyanide in flour, especially linamarine and acetone cyanohydrin. On the other hand, spontaneous fermentation method requires long time and is unstable, despite its convenience and inexpensiveness. The use of starter cultures selection results may solve the problem but it is still seen as expensive and less adaptive to traditional farmers. Therefore, the process that overcomes the limitation of spontaneous fermentation and culture starter methods is necessary, which is the back-slopping fermentation process. Efforts to increase pH after fermentation must be done either by solid state fermentation or by soaking in calcium hydroxide solution.

The stage I of the study was at: 1) analyze the decrease of cyanide level in cassava varieties of Malang 4, Malang 5 and Sembung due to microbial activities and dissolution in submerged fermentation for 72 hours; 2) analyze the relationship between the increasing pH in solid-state fermentation (0, 24, 48, 72 hours) and the decreasing of cyanide levels; 3) analyze the effect of submerged and solid-state fermentations in a series of processes - grating, submerged fermentation, solid fermentation and drying ("Gadungan Pohung") - on the characteristics of grated cassava and cassava flour; 4) determine the length of "Gadungan Pohung" solid fermentation processes on high cassava varieties which produce the highest decrease in cyanide; 5) Identify the Lactic Acid Bacteria (LAB) which plays a role in reducing cyanide level during solid fermentation. The stage II of the study was at a time to: 1) Select between a spontaneous and back-sloping submerged fermentation method that results in a faster reduction of cyanide in cassava. The solution used in the back-slopping method is water from 72 hours of submerged fermentation which added with fresh water by ratio of 1: 4. The stage III of study was at: 1) analyze the increase in pH and the decrease of cassava cyanide level (especially acetone cyanohydrin) after back-sloping submerged fermentation; 2) analyze the effect of series of processes - grating, submerged fermentation, immersion in calcium hydroxide solution (0; 0.1; 0.2; 0.3%) for 1, 2, 3, 4, 5 hours and drying - on the characteristics of cassava flour; 3) compare the "

From the stage I study, the decrease of cyanide level in cassava varieties were  $66.53\% \pm 0.05\%$ ,  $69.15\% \pm 0.40\%$  and  $38.68\% \pm 38.68\%$  for Malang 4, Malang 6 and

Sembung, respectively. After 72 hours of submerged fermentation and drying, there was a greater decrease in cyanide level of Malang 4; Malang 6; Sembung respectively by  $89.62\% \pm 0.34\%$ ;  $91.46\% \pm 0.26\%$ ;  $82.74\% \pm 0.64\%$ . When continued with solid fermentation, a decrease in cyanide was even greater due to microbial activities and also due to increased pH. Solid fermentation for 72 hours reduced cyanide level in Malang 4, Malang 6 and Sembung by  $93.43\% \pm 0.19\%$ ;  $92.56\% \pm 0.28\%$ ;  $90.12\% \pm 0.37\%$  and greater after drying. Detoxification with the "Gadungan Pohung" series produces cassava flour with cyanide content in the varieties of Malang 4, Malang 6 and Sembung at 7.75 ppm, 9.17 ppm; 10. 82 ppm respectively. The BAL which played a role in decreasing cyanide during solid fermentation were *Lactobacillus plantarum* and *Leuconostoc fallax*. The "Gadungan Pohung" process changed the chemical components, functional & amylography properties, starch digestibility and morphology of starch granules.

The results of the Part II study found that the cyanide levels of 48 hours of back-slopping fermentation were not significantly different from spontaneous fermentation for 60 hours so that it was faster to reduce cyanide, and this was due to the greater total of microbes. The results of the Part III study found that the increased pH during immersion in calcium hydroxide after submerged fermentation made the optimal conditions for degradation of linamarin and acetone cyanohydrin to become free HCN. The combination of submerged fermentation and immersion in calcium hydroxide has been shown to be effective in reducing cyanide in a shorter time than in the "Gadungan Pohung" fermentation, immersion in 0.2% calcium hydroxide for 5 hours and drying were able to reduce the cyanide level by 97.74% and produced cassava flour with cyanide content of 8. 04 ppm. Detoxification with a series of dissolution processes, submerged fermentation, immersion in calcium hydroxide and drying, reduced cyanide level, and additionally changes in chemical components, functional properties, amylography, starch digestibility and starch granule morphology.

**Keywords:** linamarin, acetone cyanohydrin, free HCN, fermentation, calcium hydroxide

attachment 2.14. Example foreword

## FOREWORD

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Praise be to Allah SWT because of His abundance of grace and grace, the author was able to complete the writing of the research paper with the title: "Detoxification of Bitter



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