

PANDUAN TUGAS AKHIR

FINAL PROJECT GUIDELINE

Program Studi Sarjana (S1) Desain Produk
Bachelor of Industrial Design (BOLD)
2018-2023



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1. UNDERSTANDING AND OBJECTIVES OF THE FINAL PROJECT

The Final Project Report is a scientific work prepared according to scientific design principles and written based on Indonesian or English rules, under the supervision or direction of the supervisor, to meet the quality criteria that have been determined according to the knowledge in the Product Design Study Program. The final assignment is carried out as an academic activity and as a requirement for completing the product design undergraduate education program. The Final Project referred to in this guideline includes the final design project report and design documents accompanying the final project. Students can program TA if they have passed a minimum of 110 credits, have passed design studio 1-5 and have done KP.

The purpose of preparing the final assignment report in accordance with **the Decree of the Chancellor of the Sepuluh Nopember Institute of Technology Surabaya Number 280/IT2/T/HK.00.01/2022** is as follows:

1. Apply logical thinking, systematic, and innovative in the critical context of the development or implementation of science and technology
2. Examine the implications of developing or implementing technological knowledge based on scientific rules, procedures and ethics
3. Identify and formulate research problems or design ideas based on the results of the study.
4. Demonstrate independent, quality and measurable performance in implementation research/design.
5. Produce solutions, ideas, designs or art criticism.
6. Prepare a scientific description of the results of the study that has been carried out in the form of a thesis or final assignment/project report, and
7. Present and defend the results in the Final Assignment/Project exam
8. Upload a summary of the report results in the ITS online publication (POMITS)

Final Assignment is the output form of a student's final work which covers the whole
The learning outcomes of the Product Design study program are:

1. Able to develop design concepts by identifying sources of problems, analyzing and synthesizing needs by considering aesthetic, comfort and user safety aspects of a product
2. Able to design product systems and product objects based on mastery of design methods, production methods and distribution systems, to produce products that can be held accountable for design principles, impacts on the environment and socio-cultural issues
3. Able to create models to solve complex design problems creatively based on design and engineering principles, taking into account economic, security, safety and environmental sustainability factors

4. Collaborate in multi-disciplinary work fields by utilizing knowledge and design abilities
5. Understand the theoretical concepts of design: 1. function, 2. aesthetics, 3. economics, 4. social and, 5. technology in general
6. Oral, written and multimedia presentation skills and presentation technology
general
7. In-depth 2 and 3-dimensional design and visualization skills
8. Design principles and methodology in depth
9. The concept of user centered design in depth
10. History and development of product design in depth
11. In-depth cultural insight and trend developments
12. Principles and current issues in manufacturing technology in general
13. Business and marketing, entrepreneurship, code of ethics and IPR (Intellectual Property Rights) in general
14. Concepts and principles of environmental conservation in general

2. SCOPE OF PRODUCT DESIGN FINAL PROJECT

Final Assignment Competency is that students are able to implement research results within the scope of styling, appliance, furniture or transportation product design based on data/real cases in a comprehensive pre-design document (primary data and secondary data, economic, technical, regulatory, standardization aspects. Pre-design document what has been formulated is realized through conceptual design along with study, analysis and problem solving which is equipped with design documents in the form of sketches, 3D digital, renderings, reports, IPR and scientific publications.

The scope of design in the final project includes:

A. Scope of the Transportation Sector

Includes: mass transportation, personal transportation, tourist transportation and special transportation such as (trains, buses, ships, rural transportation, transportation Commercial, Motorcycles, Electric Bicycles, Bicycles, Rickshaws, Military vehicles, Vehicles Plantations, etc.)

B. Scope of the Furniture Field

Includes: residential furniture, office furniture, kitchen set furniture, furniture for product sales and displays, hospital furniture, public furniture, etc.

C. Scope of the Appliances Field

Includes: electronic equipment, medical equipment, household appliances, etc

D. Scope of Styling

Includes: lifestyle products, bags, footwear products, mass craft products, tools or gaming media, etc.

One of the final outputs of the Final Project in ITS Surabaya Product Design is to follow equality in presenting prototypes in the form of Models/Mock-ups/Prototypes.

Table 1. Examples of Minimum Output Equivalence for Product Design Prototypes

TA Theme/Title	Amount Prototype	Model/ Mock-up/ Prototype
Transportation; Cars, Trains, Ships, Aircraft, and equivalent products	1 unit	Model
Transportation; Bicycles, Motorbikes and equivalent products	1 unit	Model/ Prototype
Furniture, Workstations and equivalent products	1 unit	Prototype
Medical/Medical Equipment, Foot/Hand Fake, and equivalent products	1 unit	Prototype
Home/Office Appliance, and equivalent products	1 complete set	Prototype
Electronic Equipment, and equivalent products	1 complete set	Mock-up
Apparel Products; Footwear, Bags, Costumes, Jewelry, and equivalent products	3 units	Prototype
	3 complete sets	Prototype
Toy Products, Board games, Props, and equivalent products	1 complete set	Prototype
Watches, and equivalent products	3 unit	Prototype

3. FINAL PROJECT IMPLEMENTATION TIME

The final assignment title and proposal were formulated in the design research course in semester 7 with the final evaluation in the form of Colloquium Session 1 which discussed the breadth and depth of the design theme. The urgency of the problem and background raised as the theme of the final assignment was agreed at the meeting to continue as the theme for designing the student's final assignment. Furthermore, the final assignment is completed within 1 semester after the proposed Final Assignment course is registered on the Study Plan Form. The Final Assignment is completed in a maximum of 4 semesters, if students do not pass in 4 semesters with the same TA title, then students are required to change the final Assignment title and restart the Final Assignment process from Colloquium 1 without having to take design research courses provided that the design research grades have pass category.

4. FINAL PROJECT GUIDANCE

Based on the Guidance Document for Implementing Final Assignments in the ITS Environment, the maximum number of final assignment supervisors is 2 (two) people as Supervisor I and Supervisor II. Both supervisors have the same responsibilities and duties in the mentoring process. The following are the requirements from the supervisor:

- Minimum academic qualifications: Master's Degree and Expert Assistant.
- Supervisor I is a study program lecturer.
- Supervisor I has knowledge or experience regarding the same scientific field as the Final Project theme.

d. Supervisor II can come from:

- Study Program lecturers who have retired from ITS with a minimum qualification of Master's Degree
- Industry / agency with the requirement to have capabilities equivalent to level 8 KKNl, namely:
 - 1) have a minimum academic qualification of a Bachelor's degree in the field of expertise relevant to the Final Project topic, and
 - 2) currently/have served as a manager, or
 - 3) have experience in the field of at least 10 (ten) years, or
 - 4) have publications in accredited national journals or international journals reputable

Based on the rules regarding the Operational Guidelines for Credit Score Assessment, each Serang semester, a maximum of 8 graduates can be the first supervisor, while the second supervisor can be a maximum of 4 graduates.

The final assignment guidance process follows the schedule for implementing the final assignment stages. To submit proposals and final assignment titles, students are required to consult with their supervisor at least 10 times before deciding whether they are ready for colloquium session 1.

In colloquium 1, students prepare the background of the title along with the depth and breadth of the design, product planning is equipped with primary data and secondary data to produce DrnO. For Colloquium 2, students are required to present a design concept along with alternative solutions. Meanwhile, Colloquium 3 students prepared a display presentation of the design output in the form of: (1) Product output / Mock-up / Prototype, (2)

drawings, (3) Final Assignment Report (4) Design documents including: Process sketches, presentation operational drawings, technical drawings, design videos, IPR, and scientific publication drafts. For the Final Session / Colloquium 4 students must pass Colloquium 3 which then accountable for the results of the design of the final assignment in a formal hearing with files uploaded to the integrated system at <https://thesis.its.ac.id/>.

5. FINAL PROJECT LECTURE CONTRACT

The lecture contract will be presented to students participating in the Final Assignment at the Final Assignment lecture. The Final Assignment lecture facilitates students in coordinating and implementing the final assignment in product design with a weight of 8 credits (96ECTS).

The final assignment lecture contract is mutually agreed at the study program level and follows the policy of the Sepuluh Nopember Institute of Technology.

Final Project Lectures are as follows:

1. Independent lectures in the form of studios, workshops, assistance and presentations
2. Implementation of the Final Assignment can use Laboratory facilities with the provisions that apply in the Product Design department
3. Students are required to provide consultation and assistance at least 10 times to their supervisor
4. Completeness and feasibility of the Final Assignment will be assisted by guidance from the Final Assignment lecturer, for the final Assignment proposal will be the output of the design research course.

5. Final project students are required to take part in the evaluation stages of Colloquium 1 in the design research course, and Colloquium 2, Colloquium 3 and Colloquium 4 until they are declared 'accepted/ passed' the final assignment
6. Students take part in internal exhibitions in the form of Colloquium 3 and external exhibitions in the 'Bright Future A Head' exhibition format which are held outside campus.
7. Students are required to follow the rules and ethics of scientific writing in the form of originality
8. The final project work is the property of the Sepuluh Nopember Institute of Technology can legally be used for ITS purposes.

Technical implementation of the final assignment in product design includes:

1. Porto of concept, exploration, experimentation & design process (made in A3 format; print out art-paper).
2. Draw an initial sketch (made on A3 paper) at least 30 sheets.
3. Draw alternative designs (made on A3 paper) min 5 sheets, if 3 alternatives $3 \times 5 = 15$ sheets. If there are 6 final designs = $6 \times 3 \times 15 = 90$ sheets (transportation $15 \times 3 = 45$ sheets)
4. Working Drawings (scale, only for final design), A2 tracing paper-print out.
5. 3D Digital Model/Mock-up/Simulation Study Model/Experimental/exploration results (adjusted to the research title).
6. Design drawings (digital), 3D Models & Renderings (made on full color A3 paper)
7. Product Profile Video 3-5 minutes (narration, assembly animation/shoot design process video, experiments, prototypes and product/usability tests).
8. K2 and K4 session presentation files (POWER POINT/PPT FORMAT)
9. Make a model/mock-up/prototype (according to the TA title)
10. Create a scientific article – POMMITS/art and design journal with a minimum of 6 pages.
11. Create IPR Draft; INDUSTRIAL DESIGN 1 pc.
12. Create IPR Draft; Simple Patent 1 piece.
13. Make an A3 Poster (Title, author's identity, background, concept, design results, conclusion, bibliography)
14. Make a Standing Banner (product description and design results; 3D model sketch-Experiment ProcessPrototype)
15. Final Assignment Report (according to department standards; cover, validation sheet, format writing, citations, bibliography)

6. FINAL PROJECT PROPOSAL

Implementation of the Final Assignment starts from the stages: (i) preparation of the proposal, (ii) carrying out research/implementing the design, (iii) preparing the report, and (iv) examination. The composition of the Final Assignment Proposal is arranged in 15 (fifteen) to 20 (twenty) pages consisting of an initial section and a content section. The Final Assignment/Project Proposal is prepared in a realistic, comprehensive and detailed manner. In Presenting the Final Project Proposal in Product Design, students are required to present a presentation of the Initial Concept of the design in the form of a visual presentation of 3-dimensional images.

1. Initial part of the final assignment proposal

The initial part of the final project proposal consists of:

- a. Cover Page
- b. Confirmation Page
- c. Abstract (in Indonesian and English)
- d. List of contents
- e. Image List (if required)
- f. Table List (if required)
- g. Symbol List (if required)
- h. List of Abbreviations (if required)

Sections a to h above are numbered using Roman numerals, namely: i, ii, iii, etc.

2. Cover Page

As the first front page to be read of a proposal. Cover Page

must be able to provide brief, clear and not ambiguous information to the reader about the contents of the proposal, namely in the form of title, type of Final Assignment/Project (research/design), name and NRP of student, institution, city where the institution is located and year .

The front cover page contains: the words "FINAL PROPOSAL PROPOSAL", title of Final Assignment Proposal, ITS symbol, name of author with principal number (NRP), name of study program, name of department, name of faculty, name of institution (written completely in capital letters - INSTITUTE OF TECHNOLOGY TEN OF NOVEMBER), the name of the city (Surabaya), and the year of manufacture.

The title of the Final Assignment/Project Proposal must be typed entirely in capital letters and must not be abbreviated, except for standard abbreviations.

The author's name must be written in capital letters and not abbreviated.

An example of a final assignment proposal cover page is in **Appendix 1**.

3. Confirmation Page

The confirmation page is placed on the page after the cover page. Pages

validation contains: the words "ENDORSEMENT SHEET", title of Assignment Proposal, Student's Name, Student's NRP, purpose of submitting the final Assignment, candidate's approval

supervisor and/or co-supervisor, name of prospective supervisor and/or co-supervisor, city, month and year of approval.

4. Abstract Page

Summary/abstract page, contains a brief description of the things that will be worked on implementation of the final assignment. A short description or abstract containing the things that will be done in the final assignment consisting of 200 - 300 words. A summary of the research plan/design plan/project, which contains answers to the questions, what, why, and how the research/design will be carried out. Examples of abstracts or short descriptions in Indonesian and English can be seen in **Attachments 3 and 4** respectively

5. Table of contents/Figures/Tables

The Table of Contents contains all parts of the text along with their respective page numbers, which are written in the same way as the content in question. The table of contents/images/tables can be printed using Microsoft Word (MS Word) automatically using the "Heading" feature which is arranged in such a way, so that students will not have difficulty typing them one by one manually in the order of chapters or sub-chapters, images or table. In the Table of Contents section, the author provides an outline of the chapters and sub-chapters that will fill the Final Assignment sheet

6. Contents of the final assignment

The division of chapters from introduction to methodology is determined by the faculty according to needs, or systematically as follows.

The 'Core' or 'Body' section of the final project proposal generally contains:

- a. Introduction
 - i. Background
 - i. Problem Formulation
 - iii. Problem Limitation or Scope
 - iv. Objective
 - v. Benefit
- b. Library Review
 - i. Results of previous research/planning
 - ii. Basic theories/concepts
- c. Methodology
 - i. Method used
 - i. Materials and equipment used
 - iii. Sequence of research implementation
- d. Bibliography
- e. Attachments (if required)

The sequential page numbers in the body of the proposal use Arabic numerals, namely: 1, 2, 3, etc. For Final Assignments in the form of design/design, the composition of the 'Core/Main' sections can be determined by the faculty/department according to needs.

a. Introduction

The introduction contains things that encourage or things that provide the background for the importance of carrying out the research or design. A description of research in this area is very important for improving or solving problems or producing designs. The components in this chapter are:

i. Background

This section generally contains the background and reasons for the author choosing the research/design object. The description begins with an explanation of general matters related to the TA/PA topic, then is directed to more specific matters, namely the title of the TA/PA proposal. The object to be researched must be explained concretely as an introduction to the problem, and as a result of research/previous studies/analysis results on secondary data, about the object to be researched/designed, accompanied by reasons why the problem needs to be researched or why the object needs to be designed properly. theoretical and practical.

ii. Problem Formulation

Research/design problems must be written in declarative form or with firm and clear question sentences. The research/design problem is the formulation of the gap between the existing situation and the condition to be achieved. Problem formulation is carried out based on the identification of the problem and the scope of the research to be solved or the scope of the object to be designed.

This problem formulation is expressed in the form of questions which will later be answered in the problem analysis using relevant theories or concepts and supported by data from the research/design implementation that will be carried out.

When formulating a problem, it is necessary to avoid asking too many questions, which means that the problem formulation is not written in the form of too many questions.

Some study programs can add elements of research/design hypotheses.

A hypothesis is basically an answer or temporary solution to the problem posed in the TA/PA problem formulation. Research/design hypotheses can be deemed necessary for some specific research/designs.

iii. Problem Limitation or Scope

The scope/limitation of the problem in an effort to focus the research/design that will be carried out becomes more focused. Limitations can be made in terms of breadth, depth, the ability of researchers/designers in certain aspects, or all of these aspects. Restrictions must be accompanied by reasons or arguments why problem limitations need to be implemented. Problem boundaries are related to research variables or design variables, variables and/or parameters for research/design variables, and/or variables/parameters that are assumed to be constant parameters or parameters that are ignored (O'leary, 2017).

iv. Research/Design Objectives

The research/design objective contains a description of the author's aim in conducting research/design, namely to answer the questions that have been written in the problem formulation section or the results to be achieved or answers to research/design problems. Research/design objectives can be written in a series of objectives, which are more specific objectives, which support the research/design objectives. Some study programs can replace the Research/Design Objectives sub-chapter with Research/Design Aims and Objectives, where both terms are often articulated in points and generally use 'to' statements, for example:

- to develop ...;
- to identify...;
- to explore...;
- to measure...;
- to explain...;
- to describe...;
- to compare...;
- to determine.... ;
- to apply;
- to design/design.....

In writing goals, writers can use the 'SMART' principle. SMART is an abbreviation for specific, measurable - measurable, achievable - can be achieved, relevant/focused on results/realistic, and time bound - time bound. The aim is to clearly articulate what students want to achieve in carrying out research/design, or answering research/design problems that have been written previously.

The form of answer to the research/design problem can be in the form of "development results", "results of identifying a symptom", "results of exploration", "results of measurement", "results of explanation", "results of application", "results of comparing", "results of application", or "the results of making a prototype", and so on.

v. Benefits of Research/Design

This section describes briefly but clearly the contribution of research/design results to the development of the fields of science, technology, art and/or to solving development problems, and/or to institutional development.

b. Library Review

The literature review consists of two parts, namely: (i) the results of relevant previous research/design, and (ii) the theoretical basis and framework related to the research/design problem. The literature review contains the latest references, relevant, and original. A literature review is a specific part of argumentative writing that involves relevant scientific and academic research/design in the research/design. The role of a literature review is to write down information about developments in facts/findings in the field, theories, and research materials or objects

other plans. The theory written is a theory that supports and is relevant to the research/design problem. This information is used to build the author's credibility in building knowledge, which is directed at developing a framework of thought or concepts that will be used in research or design (O'leary, 2017).

Relevant previous research/design results are research/design that has been carried out by various parties, and if possible, not the results of previous TA/PA implementation, but from scientific journals, patents, or other design reports from credible institutions.

c. Methodology

Research/design/tool development methodology is a way to solve research/design problems systematically (Kothari, 2004).

The research/design/tool-building methodology has many dimensions and the research/design/tool-building method is part of the research/design/tool-building methodology. Scope of research methodology/design/

tool building is broader than research/design/tool building methods. In the research/design/tool development methodology, consideration of the logic behind the methods used in the context of research/design/tool development is used, and explains why researchers/designers use certain methods or techniques. The methodology contains an explanation to articulate the research/design plan clearly and in detail. The research/design plan can be illustrated in the form of a flow chart/table of the stages in the research/design, in order to answer the research/design problem (Prabhat, 2015). The research/design methodology is an outline of what the researcher/designer will do starting from writing the hypothesis and its operational implications to the final analysis of the data. The written research/design plan includes:

- (1) What is the research/design about?
- (2) Why is the research/design carried out?
- (3) Where will the research/design be carried out?
- (4) What type of data is needed?
- (5) Where can the data needed for research/design be found?
- (6) How long and what is the time period of the data in the research/design?
- (7) What will be the sample in the research or design object?
- (8) How are the techniques in data collection or planning?
- (9) How will the data be analyzed?
- (10) How will the report be prepared?

The form of plans/stages in research/design can also include: materials, equipment, and working methods as well as techniques/processes of research/design work. Materials are materials, data and other research/design results. Research/design equipment is laboratory and field test equipment, hardware and software, or theory and equations. The process in research/design is data collection and analysis techniques, the model of approach used, research design or tool design, how to interpret and collect research results, testing equipment/design, how to evaluate, and how to draw conclusions. In this chapter it is also necessary to explain the location of the Final Assignment/Project.

If the final assignment/project is part of the "capstone design" activity, then in

The proposal contains the following stages:

- i. Write down real problems in the field that will be solved.
- ii. Determine the specifications of the system that will be designed to solve the problem on (i).
- iii. Write down all decisions that are important to realizing the product be part of (ii).

7. Activity Plan and Schedule

The activity schedule contains details of each research/design activity written in tabular form, and marked (in darker shading) in weeks. An example of an activity schedule can be seen in **Appendix 5**.

8. Supporting attachments

Supporting attachments can be presented at the end of the proposal in the form of evidence of primary data research or the ongoing final project research process

9. Bibliography

The bibliography consists of two, namely (i) a list of references, and (ii) a reading list/bibliography of all references referred to in the proposal. When writing a bibliography, you can write only the reference list or both, namely the reference list and the reading list.

The title of this section is Bibliography. An explanation of the bibliography can be read in sub-chapter 3.11.

10. Format Proposal

Typing the final assignment/project proposal follows the following provisions:

- Paper type and size:

80 gram HVS paper, A4 size (210 mm x 297 mm)

- Spacing: 1 (one/single)

- Edge distance (margin):

• Top edge • : 3.0 cm

Bottom edge • Left : 2.5 cm

edge • Right : 3.0 cm

edge • Typeface : : 2.0 cm

• Times New Roman, Normal, size 12 (specific sizes can be used for titles
14pt

• Words originating from foreign languages that are not translated are written in italics.

7. FINAL PROJECT REPORT

1. Systematics

The systematics of the Final Assignment Report from the Introduction to the Conclusion can be determined by the faculty/department according to needs, or with the following systematics. The systematics of the Final Project report consists of three major parts, namely:

A. The 'Initial' section consists of:

- 1) Front cover and title page of final assignment/project in Indonesian and English (Appendix 6 – 8)
- 2) Confirmation Page (Appendix 9)
- 3) Originality Statement Page (Appendix 10)
- 4) Abstract or short description in Indonesian and English (Lampiran3 – 4)
- 5) Foreword
- 6) Table of Contents
- 7) List of Images/Graphs/Diagrams
- 8) Table List
- 9) Symbol List (if any)
- 10) List of Abbreviations (if any)

The explanation of the points above is the same as in the Final Project proposal. Tables of contents, lists of figures, and lists of tables can be done using the automation features provided by MS Words.

B. The 'Core/Main' or 'Body' section contains:

a. Introduction

- i. Background
- ii. Problem Formulation
- iii. Scope of problem
- iv. Goal
- v. Benefit

b. Library Review

- i. Results of previous research/design
- ii. Basic theories/concepts

c. Methodology

- i. Method used
- ii. Materials and equipment used
- iii. Sequence of research/planning implementation

d. Results and Discussion

Research/design results

- i. ii. Discussion/Discussion (analysis, synthesis and evaluation)

e. Conclusions and Suggestions

- i. In the form of research/design results that answer problems or in the form of concepts, programs and design work
- ii. Suggestions (if deemed necessary), contain things that can still be done better and can be developed further, or contain problems experienced during the process of working on the final assignment/project.

The contents of the Final Assignment report, which are written in points a to e above, have been partially explained in chapter 2 (Final Assignment Proposal). For Final Assignments in the form of design/design, the composition of the 'Core/Main' sections can be determined by the faculty/department according to needs.

C. The 'Final' section consists of:

- a. Bibliography
- b. Attachments or Appendices (if any)
- c. Author Bio

2. Final Assignment Report Format

Typing the final assignment/project must follow the following provisions:

a. Paper type and size:

80 gram HVS paper, A4 size (210 mm x 297 mm)

b. Spacing: 1 (one/single)

c. Edge distance (margin):

Top edge	: 3.0 cm
Bottom edge	: 2.5 cm
Left edge	: 3.0 cm
Right edge	: 2.0 cm

d. Typeface

Times New Roman, Normal, size 12.

e. Tables and figures, if any, are presented on the same paper wherever possible.

f. Page number

The beginning of the page is marked with Roman numerals in lower case (i, ii, iii, iv, v, .. dst)

The main/main parts or body and ending are numbered sequentially with Arabic numerals, starting with number 1 and starting from the introductory chapter to the attachments/appendix.

Page numbers are written at the bottom (footer) on the right.

Page numbering can be done using MS Word automation in the "insert page number" feature.

g. Tables and Figures

Tables are numbered sequentially in each chapter with Arabic numerals with the following writing conditions:

The number consists of 2 parts, the first part shows the chapter while the second part shows the table number (example: Table 2.1, Table 3.2, Table 3.3, etc.).

- The table number and title are placed above the table and every word starts with a capital letter except conjunctions.

The pictures are numbered sequentially in each chapter with Arabic numerals with the following writing conditions:

- The number consists of 2 parts, the first part shows the chapter while the second part shows the image number. (example: Figure 2.1, Figure 3.2, Figure 3.3, etc.).

- Image Number and Title are placed below the image as well as each word begins capitalized except for conjunctions.

Numbering tables and figures can be done using MS Word automation

in the "caption" feature.

h. The thickness of the face skin and back skin is not more than 1 mm (soft cover).

i. Title page

- Chapters and chapter titles: typed in all capital letters on a new page with a balanced distance from the left and right edges (center), and bolded. The chapter number is written in Roman letters and the chapter title is written on the next line.

- Sub-headings/sub-chapters: the first letters of each word, except conjunctions, are written in bold capital letters and placed starting from the left edge.

- Sub-headings/sub-sub chapters: written starting from the left edge and in bold.

- The first letter of the sub-heading is written in capital letters.

- If there is still a title in a lower level, it is written as in children
the sub-county.

Settings for chapters, sub-chapters, sub-sub-chapters, etc. can be done using

Automate MS Words by setting the features: "Heading 1", "Heading 2", "Heading 3", dst.

J. mold

All library sources that are directly referenced must be included. How to include sources can be seen in sub-chapter 3.11. Standards for writing library sources cited in the contents of the TA Report, using the "APA" standard - American Psychological Association 7th edition. Writing can be done using MS Words automation, using the "References - Manage Source" feature, or using the "References - Manage Source" feature. Mendeley Desktop which has been installed in MS Word.

With the help of this software, it is possible to print bibliography automatically, without typing manually.

3. Title Page

Front cover page, containing: the words "FINAL PROJECT", title of Final Assignment/Project, ITS logo, author's name with principal number (NRP), name of study program, name of department, name of faculty, name of institute (written completely in capital letters - INSTITUTE TEN NOPEMBER TECHNOLOGY), and the name of the city (Surabaya), as well as the year of manufacture.

The title page contains: the words "FINAL PROJECT", title of Final Assignment/Project; ITS symbol, author's name with principal number (NRP), study program name, department name, faculty name, institute name (written in full), and city name (Surabaya), as well as year of creation. The title page is written in English and Indonesian on different pages.

The title of the Final Assignment/Project must be typed entirely in capital letters and must not be abbreviated, except for standard abbreviations.

The author's name must be written in capital letters and not abbreviated.

An example of the front cover page is in Appendix 6 and the title page is in Appendix 7 (Indonesian) and Appendix 8 (English).

4. Confirmation Page

The validation page functions to guarantee the validity of the scientific work results of the final assignment. The validation page is placed on the page after the title page. The validation page contains: the words "ENDORSEMENT SHEET", the title of the Final Assignment, the purpose of submitting the TA, the approval of the supervisor and/or co-supervisor, and examiner, the name of the supervisor and/or co-supervisor, as well as the name of the examiner, city, month and year of validation . Example of validation page in Appendix 9.

5. Originality Statement Page

This page contains a written statement from the author and acknowledged by the supervisor stating that the final assignment/project prepared is the result of his own work and was written following the rules of scientific writing. An example of an Originality Statement Page can be seen in Appendix 10.

6. Abstract Page

The abstract page contains: title, author's name, NRP, name of supervisor and/or name of co-supervisor, abstract and keywords. The abstract page is written in Indonesian and English on different pages. Number of words 200 - 400 words, including keywords. Examples of abstract pages can be seen in Appendix 3 (Indonesian) and Appendix 4 (English).

7. Foreword Page

The Foreword is no more than one page, containing an explanation of the purpose of writing the final assignment/ project report, including thanks to people who have contributed directly to the preparation of the Final Assignment. The text " FOREWORD " as the title of this page is written entirely in capital letters.

Note: Acknowledgments addressed to people who contributed to the implementation of the Final Assignment and have not been included in the Foreword sheet, are written on a separate sheet and placed after the Attachment sheet.

8. Table of Contents Page

What is included in the table of contents: title page, validation sheet, abstract, foreword, table of contents, list of tables, list of figures, list of symbols, chapters up to sub-chapters, bibliography, attachments, all complete with appropriate page numbers. The text "TABLE OF CONTENTS" as the title of this page is written entirely in capital letters.

The contents in the table of contents can be done automatically using features in MS words "References - Table of Contents".

9. Image List Page

The format for writing a list of images is identical to the format for writing a table of contents. The text LIST OF IMAGES as the title of the list of images is written entirely in capital letters.

Filling in the image list can be done automatically using the on feature

MS words "References - Insert caption - Table of Figures".

10. Table List Page

The format for writing a table list is identical to the format for writing a table of contents. Writing TABLE LIST as the title of the table list is written entirely in capital letters.

The contents in the table list can be done automatically using the on feature

MS words "References - Insert caption - Table of Figures".

11. Bibliography

Writing the bibliography which is placed at the end of the contents of the Final Assignment report, is carried out using APA (American Psychology Association) 7th edition standards.

This writing standard is used for all fields of knowledge, namely: science, engineering, computing, design, art and others (Southern Institute of Technology, 2020). The grouping of libraries in APA version 7.0 is more concise than in APA version 6.0.

In general, writing a bibliography in APA standards, version 7.0 is as follows:

- 1) The bibliography starts on a separate page from the contents page in the report TA/PA.
- 2) The bibliography will appear in alphabetical order by author's last name First.
- 3) Print results according to APA standards using hanging indents. Second row in the bibliography, indented below the first line.

- 4) Writing title capitalization only at the beginning of the sentence, which is different from writing the title of the original manuscript.
- 5) Capitalize the title of the reference list. Capitalize only the first letter of titles and subtitles of books, articles, reports, chapters on web pages, and unpublished magazine titles in capitalize the first letter of all important words in titles for periodicals.
- 6) APA citations and references use an ampersand (&) between the author's last name, NOT "and". But if the author's last name is used in a sentence, then the word "and" is used according to normal writing rules.
- 7) Write the DOI and URL in the bibliography as hyperlinks (i.e. starting with "http:" or "https:"). The default display settings within MS Words are for hyperlinks (usually blue font, underlined) or plain text that is not underlined. We recommend that this link remain accessible online.
- 8) Some DOIs or URLs are written long or complicated, here a short version of the DOI or shortened URL can be used. To change the short version of the DOI, you can use the shortDOI service provided by the International DOI Foundation (<http://shortdoi.org/>). Enter cut and paste DOI and the service will create a new shortDOI.
- 9) It is not advisable (don't) to include the date the reference was taken, unless it comes from a web page that is inherently designed to change (e.g. dictionary entries, Twitter profiles, Facebook pages, maps created by Google Maps) or reflects information that changes over time (websites that frequently update information, such as Stats NZ). Here we can write the retrieval date, if necessary, before the URL, for example Accessed December 2, 2019, from <https://xxxxx>
- 10) APA 7th edition DOES NOT REQUIRE data base entry: city, state (in the US) or country where the book is published. This is a significant change from the APA 6th edition.

The reference form in APA standard version 7.0 is divided into 2 (two) categories, namely: Books and articles published periodically. How to write in the bibliography and in text citations is explained in the following chapter. This explanation can automatically be printed in the written output using the help of MS Word, in the "Reference" feature, with mode: Style "APA". If you use MS Word automation, the author does not need to type manually, and the results will appear both in the text as citations, and in the reference list as a list of references used.

1. If the reference is in the form of a book

a. Books without DOI identification, in print version, and no digital version.

Format:

Author, A. A. (year). Title of book. Publisher

Example:

Lloyd Owen, D. A. (2018). Smart water technologies and techniques: Data capture and analysis for sustainable water management. John Wiley & Sons.

How to write a citation:

According to Lloyd Owen (2018, p.2) ... or ... (Lloyd Owen, 2019, p. 2)

b. Books with DOI or url, retrieved via online system

ÿ Include DOI if available

ÿ Include the URL if there is no DOI and the URL is accessible to all readers

Do not use URLs from online academic library databases, as they are generally not accessible to all readers, except students at the university who can log in. Add other information if there is no publicly accessible DOI or URL, the references are the same for printed books.

Book, and if available DOI

Format:

Author, A. A. (year). Title of book. Publisher. <https://doi.org/xxxx>

Example:

Cameron-Smith, A. (2019). A doctor across borders: Raphael Cilento and public health from empire to the United Nations. Australian National University Press. <https://doi.org/10.22459/DAB.2019>

How to write a citation:

According to Cameron-Smith (2010, p.17) ... or ... (Cameron-Smith, 2019, p. 17)

Books, with no DOI available but a URL accessible to all readers

Format:

Author, A. A. (year). Title of book. Publisher. <https://www...>

Example:

Scanlon, V. C., & Sanders, T. (2007). Essentials of anatomy and physiology (5th ed.). FA Davis. <https://yhdp.net/uploads/Essentials-of-Anatomy-and-Physiology.pdf>

How to write a citation:

According to Scanlon and Sanders (2007, p.46) ... or ... (Scanlon & Sanders, 2007, p. 46)

Books, if there is no DOI and can be accessed via the online library

Format:

Author, A. A. (year). Title of book. Publisher.

Contoh:

Budras, K.-D., Greenough, P. R., Habel, R. E., & Mjlling, C. K. W. (2011). Bovine anatomy (2nd ed.). Schlytersche

How to write a citation:

Budras et al. (2011) states ... or ... (Budras et al., 2011)

c. Books, editions other than the 1st edition

Format – print

Author, A. A., & Author, B. B. (year). Title of book (2nd ed.). Publisher.

Contoh:

Marieb, E. N., & Hoehn, K. (2016). Human anatomy & physiology (10th ed.). Pearson.

How to write a citation:

According to Marieb and Hoehn (2016, p. 419) ... or ... (Marieb & Hoehn, 2016, p. 419)

d. Edited book, no DOI

Format:

Editor, A. A., & Editor, B. B. (Eds.). (year). Title of book. Publisher.

Contoh:

Lindquist, R., Snyder, M., & Tracy, M. F. (Eds.). (2014). Complementary & alternative therapies in nursing (7th ed.). Springer.

How to write a citation:

Lindquist et al. (2014) states ... or ... (Lindquist et al., 2014)

e. Edited book with DOI

Format:

Editor, A. A. (Ed.). (year). Title of book. Publisher. <https://doi.org/10.xxxx/xxxxxx>

Contoh:

Helbich, M. (Ed.). (2018). Frontiers in mental health and the environment. MDPI. <https://doi.org/10.3390/books978-3-03897-391-1>

How to write a citation:

Helbich (2018) ... or ... (Helbich, 2018)

f. Books in languages other than English (for example in Japanese)

For references in the form of books written in languages other than English, please write them in the reference list by marking [

Format:

Author, A. A., & Author, B. B. (year). Title of book [Translation of book title]. Publisher.

Example:

Molinari, E., & Labella, A. (2007). Clinical psychology: Dialogue and confrontation]. Springer.

Amano, N., & Kondo, H. (2003).

Japanese Language] (Vol. 7). Sanseido.

How to write a citation:

Molinari and Labella (2007, p. 25) state ... or ... (Molinari & Labella, 2007, p. 25)

Amono and Kondo (2003) state ... or... (Amono & Kondo, 2003)

g. Books republished in translation

Format:

Author, A. A., & Author, B. B. (year). Title of book (T. Translator, Trans.). Publisher. (Original work published year).

Example:

Schiller, F. (2018). Don Carlos infant of Spain: A dramatic poem (F. Kimmich, Trans.). Open Book. (Original work published 1804).

How to write a citation:

Schiller (1804/2018, p.19) ... atau ... (Schiller, 1804/2018, p.19)

h. Manual, Print version

If the author and publisher are the same name, the publisher name is ignored.

Example:

Brother Industries. (n.d.). Reference guide: Brief explanations for routine operations HS-J6000DW HL- J6100DW. Citation: Brother Industries (n.d., p.1)... OR ... (Brother Industries, n.d., p.1)

i. Manual, which is accessed online

Example:

World Health Organization. (2019). International statistical classification of diseases and related health problems (11th ed.). <https://icd.who.int/>

Canterbury District Health Board. (2019, January 25). Hand hygiene (Ref. 234641). <http://edu.cdhb.health.nz/Hospitals-Services/Health-Professionals/CDHB-Policies/Infection-Prevention-Control-Manual/Documents/Hand-Hygiene- Policy.pdf>

How to write a citation:

World Health Organisation (2019) ... atau ... (World Health Organisation, 2019)

Canterbury District Health Board (2019, p. 2) ... atau ... (Canterbury District Health Board, 2019, p.2)

2. Chapters in the edited book

a. Chapters from edited books, and no DOI

Format:

Author, AA (year). Title of chapter. In B. Editor & C. Editor (Eds.), Title of book (2nd ed., pp. pages of chapter). Publisher.

Example:

Casida, J.E. (2010). Pest toxicology: The primary mechanisms of pesticide action. In R. Krieger (Ed.), Hayes' handbook of pesticide toxicology (3rd ed., pp. 103-117). Academic Press.

How to write a citation:

Casida (2010, p. 105) states...

or... (Casida, 2010, p. 105)

b. Chapters from edited books, and DOI available

Format:

Author, AA (year). Title of chapter. In B. Editor & C. Editor (Eds.), Title of book (2nd ed., pp. pages of chapter). Publisher. <http://doi.org/10.xxxx/xxxxxx>

Example:

Wall, R., & Rafferty, A. M. (2017). Trouble with "status": Competing models of British and North American public health nursing education and practice in British Malaya. In H. Pols., C.M. Thompson., & J. H. Warner (Eds.), Translating the body: Medical education Southeast (pp. 67-94). in Asia
<https://doi.org/10.2307/j.ctv1xxzqp> Nut press.

How to write a citation:

Wall and Rafferty (2017, p. 82) state ... or ... (Wall & Rafferty, 2017, p. 82)

c. Dictionary, thesaurus, or encyclopedia

If the author and publisher are the same name, the publisher is ignored. For printed version reference sources.

Example:

Merriam-Webster. (2019). Merriam-Webster's Collegiate Dictionary (11th ed.).

How to write a citation

Merriam-Webster (2019) ...

atau ... (Merriam-Webster's Collegiate Dictionary, 2019)

For online versions of reference sources that are updated continuously, for example the Merriam-Webster.com Dictionary, write "nd" as the year of publication and include the date of retrieval / access time.

Example:

Merriam-Webster. (n.d.). Merriam-Webster.com dictionary. Retrieved November 28, 2019, from <https://www.merriam-webster.com/>

How to write a citation:

Merriam-Webster (nd) ... or ...
(Merriam-Webster, nd)

3. Articles published periodically

Articles published periodically, including: (i) journals, (ii) magazines, (iii) newspapers, (iv) bulletins, (v) blogs, and (vi) other online platforms that publish articles. Journals and magazines have an identity by having a volume/edition number. For example, a journal with the identity volume 6, number 2.

In this case the volume number is italicized followed by the number in brackets but not italicized. Example; 6 (2)

a. Journal articles with DOI

Use sentence capitalization in article titles. Capitalize the first letter of each main word in the journal title. Italicize the journal title and volume number.

Add publication number if available, include DOI number; usually appears on the first page of the article.

Format:

Author, A. A., Author, B. B., & Author, C. C. (year). Title of article. Title of Periodical, xx, pp-pp. <https://doi.org/xxxx>

Example:

Montayre, J., Dimalapang, E., Sparks, T., & Neville, S. (2019). New Zealand nursing students' perceptions of biosciences: A cross-sectional survey of relevance to practice, teaching delivery, self-competence and challenges. *Nurse Education Today*, 79, 48-53. <https://doi.org/10.1016/j.nedt.2019.05.013>

How to write a citation:

Berman et al. (2012, p. 537) ... or ... (Berman et al., 2012, p. 537)

b. Journal articles without DOI, and no URL available (including URLs that can only be accessed by the individual)

Format:

Author, A. A., Author, B. B., & Author, C. C. (year). Title of article. Title of Periodical, xx, pp-pp. <https://xxxxx>

Example:

Akin, D., & Huang, L. M. (2019). Perceptions of college students with disabilities. *Journal of Postsecondary Education and Disability*, 32(1), <https://www.ahead.org/professional-resources/publications/jped/archieved-jped/jped-volume-32> 21-33.

How to write a citation:

Statement from Akin and Huang (2019, p.21) ...or... (Akin & Huang, 2019, p.21)

c. Journal articles without DOI, from academic research databases

Journal articles found in academic institutional databases. The URL for the database is provided instead of the DOI, for example <http://ezproxy.sit.ac.nz:xxxxx>

In this case, do not replace the database name or URL.

Example:

Whitehead, A., & Gould Fogerite, S. (2017). Yoga treatment for chronic non-specific low back pain. *Explore: The Journal of Science & Healing*, 13(4), 281-284.

How to write a citation:

Whitehead & Gould Fogerite (2017, p. 282) states... or ... (Whitehead & Gould Fogerite, 2017, p. 282)

d. Journal articles with DOI, and the number of authors is 21 or more

Since the original DOI was long and complex, a short DOI was used. Long or short forms of DOI are acceptable. List the first 19 authors, then use ... and then list the last author's name.

Example

Gaudinski, MR, Coates, EE, Houser, KV, Chend, GL, Yamshchikov, G, Saunders, JG, Holmans, LA, Gordon, I, Plummer, S, Hendel, CS, Conan-Cibotti, M, Lorenzo, M., L., Sitar, S., Carlton, K., Laurencot, C., Bailer, R. T., Narpala, S., McDermott, A. B., Namboodirir, A., M., ... Ledgerwood, J. E. (2018). Safety and pharmacokinetics of the Fc-modified HIV-1 human monoclonal antibody VRC01LS: A phase 1 open-label clinical trial in healthy adults. *PLoS Med*, 15(1), e1002493. <https://doi.org/10.1371/journal.pmed.1002493>

e. Journal articles with DOI, author individually or in a group

Example:

Eysenbach, G., & CONSORT-EHEALTH Group. (2011). CONSORT-EHEALTH: Improving and standardizing evaluation reports of web-based and mobile health interventions. *Journal Medical Research*, 13(4), <https://doi.org/10.2196/jmir.1923> e126.

f. Journal articles in press

Articles in press are peer reviewed, where the article is accepted and will be published in a journal, but has not been assigned to a particular volume/issue. Although articles in press do not yet have all the bibliographic details available, they can be cited using the online publication year and DOI.

Example:

Kreuzer, M., Cado, V., & Raies. (2019). Moments of care: How interpersonal interactions contribute to luxury experience of healthcare consumers. *Journal of Business Research*. <https://doi.org/10.1016/j.jbusres.2019.11.033>

g. Articles in magazines, online

Write the month and date of publication of the magazine after writing the year of publication.

Example:

Jousset, P. (2019, November 29). Illuminating earth's faults. *Science*, 366(6469), 1076-1077. <https://science.sciencemag.org/content/366/6469/1076> How to write a citation:

Jousett (2019) Atau... (Jousett, 2019)

h. Articles in newspapers, online

Articles in online newspapers can be a reference. How to write in italics, for the month and date, and written after the year.

Reference:

Harding, E. (2019, November 21). Invercargill Kmart ready to open. *The Southland Times*. <https://www.stuff.co.nz/national/117596378/invercargill-kgmart-ready-to-open>

How to write a citation:

Harding (2019) wrote.... or ... (Harding, 2019)

i. Articles on webpages - which are not categorized as newspapers

Example:

Taunton, E. (2019, December 2). Low methane New Zealand sheep coming to a farm near you. *Stuff*. <https://www.stuff.co.nz/business/farming/117862851/low-methane-sheep-coming-to-a-farm-near-you>

How to write a citation:

Taunton (2019) ... OR ... (Taunton, 2019)

12. Author Biodata

Written on the last page and contains the author's resume, including place and date of birth, educational history, prominent activities, organizations, achievements achieved, etc. In the upper left corner is displayed the author's latest closed-up photo measuring (4 x 6) cm and color photos are recommended. An example of biodata can be seen in Appendix 11.

8. DOCUMENTS AND FINAL ASSIGNMENTS

Documents as output of the Final Project in ITS Surabaya Product Design include:

1. Final Assignment Report
2. Prototype output in the form of a model/ Mock-up/ Prototype
3. Scientific Publication Journal Articles for POMITS and Book Chapters.
4. Design Process Document in the form of alternative sketches (45-90 sheets)
5. 3D Model File Drawn according to CAD and CAE rules
6. Final Project Portfolio
7. Presentation Slides for Final Project Exhibition
8. Video Profile Product
9. IPR Draft (Industrial Design and Simple Patent)

9. FINAL PROJECT EVALUATION

In colloquium 1, students prepare the background of the title along with the depth and breadth of the design, product planning is equipped with primary data and secondary data to produce DrnO. For Colloquium 2, students are required to present a design concept along with alternative solutions. Meanwhile, Colloquium 3 students prepared a display presentation of the design output in the form of: (1) Product output / Mock-up / Prototype, (2)

Presentations, (3) Final Assignment Reports (4) Design documents including: Process sketches, presentation drawings, operational drawings, technical drawings, design videos, IPR, and scientific publication drafts. For the Final Session / Colloquium 4 students must pass Colloquium 3 which then accountable for the results of the design of the final assignment in a formal hearing with files uploaded to the integrated system at <https://thesis.its.ac.id/>. In carrying out the Final Assignment Session, it consists of the chair of the session, namely 1 supervisor, and a minimum of 2 final assignment examiners. The assessment of the Final Assignment Session at Colloquium 4 considers the completeness of Colloquium 3 which was held as an exhibition.

The final assignment assessment criteria include 5 assessment rubrics including: (1) 40% weight for model/mock-up or prototype grades, (2) 20% assessment weight for presentation and verbal communication skills, attitude and appearance, (3) 20% weight for complete and thorough design documents, (4) 10% weight for report assessment including content, systematics and writing, (5) 10% weight for Design Concept includes: Methodology, analysis, design concept and criteria including design alternatives.

BIBLIOGRAPHY

Minister of Education and Culture, Republic of Indonesia, Minister of Education and Culture Regulation No. 3 2020 concerning Higher Education Standards (SN Dikti) (2020).

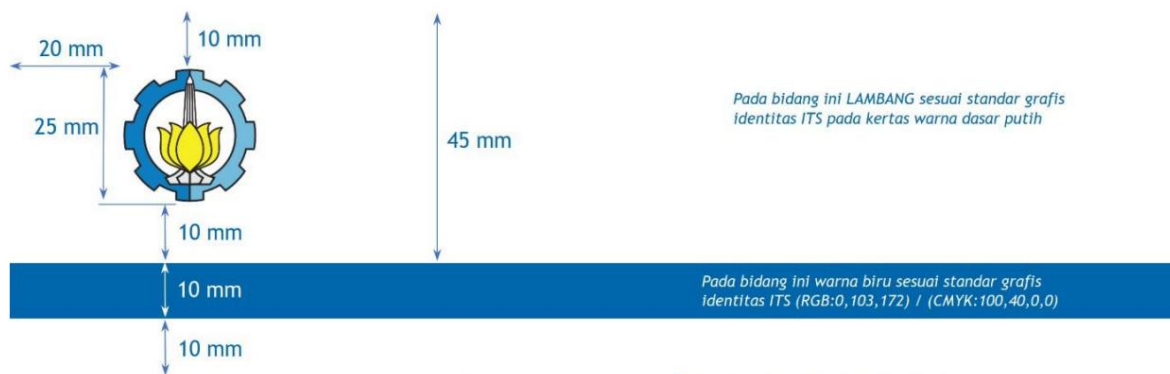
Kothari, C. R. (2004). Research Methodology: Methods and Techniques. O'leary, Z. (2017).

The Essential Guide to Doing Your Research Project. Prabhat, P. (2015). RESEARCH METHODOLOGY: BRIDGE CENTER. Southern Institute of Technology. (2020). APA Style 7.

Systems Engineering Course Research Methods; all slides Systems Engineering Course

Research Methods; Information. (n.d.).

APPENDIX 1: Example of Final Assignment Proposal Cover Page



PROPOSAL TUGAS AKHIR - QQXXXXXX Trebuchet MS (Bold) 14 pt

**JUDUL PROPOSAL TUGAS AKHIR DITULIS SINGKAT,
JELAS DAN MENGGAMBARAKAN TEMA POKOK**

Trebuchet MS (Bold) 18 pt

NAMA MAHASISWA Trebuchet MS (Bold) 14 pt

NRP XXXXXXXXXXXXXXX Trebuchet MS 14 pt

Dosen Pembimbing Trebuchet MS 14 pt

Nama Pembimbing dan Gelar Trebuchet MS (Bold) 14 pt

NIP XXXXXXXXXXXXXXX Trebuchet MS 14 pt

Program Studi <Nama Program Studi> Trebuchet MS (Bold) 12 pt

Departemen <Nama Departemen>

Fakultas <Nama Fakultas>

Institut Teknologi Sepuluh Nopember

Surabaya

Tahun

Trebuchet MS 12 pt

20 mm

APPENDIX 2: Example Final Assignment Proposal Confirmation Page

VALIDITY SHEET

THE TITLE OF THE FINAL PROJECT PROPOSAL IS WRITTEN SHORTLY AND CLEARLY
AND DESCRIBE THE MAIN THEME

FINAL PROJECT PROPOSAL

Submitted to fulfill one
requirements for obtaining the title <Name
Degree> in the Undergraduate Study Program
<Study Program Name> Department
<Department Name>
Faculty <Faculty Name>
Tenth Institute of Technology
November

By: <STUDENT NAME>
NRP. <XXXXXXXXXX>

Approved by the Final Project Proposal Examining Team:

- | | |
|---|-----------|
| 1. Name and title of supervisor | Mentor |
| 2. Name and title of co-supervisor/examiner | Co-mentor |
| 3. Name and title of examiner | Examiner |
| 4. Name and title of examiner | Examiner |
| 5. Name and title of examiner | Examiner |

Surabaya
Month year

APPROVAL SHEET

THE TITLE OF THE FINAL PROJECT PROPOSAL IS WRITTEN BRIEFLY,
CLEARLY AND DESCRIBING THE MAIN THEME

FINAL PROJECT PROPOSAL

Submitted to fulfill one of the requirements
for obtaining a degree <name of degree> at
Undergraduate Study Program of <name of Study Program>
Department of <name of Department>
Faculty of <name of Faculty> Institut
November Tenth Technology

By: <NAME OF STUDENT>
NRP. <XXXXXXXXXX>

Approved by Final Project Proposal Examiner Team:

- | | |
|---|------------|
| 1. Name of Advisor and academic title | Advisor |
| 2. Name of Co-Advisor/Examiner and academic title | Co-Advisor |
| 3. Name of Examiner and academic title | Examiner |
| 4. Name of Examiner and academic title | Examiner |
| 5. Name of Examiner and academic title | Examiner |

SURABAYA

Month, Year

APPENDIX 3: Example of Indonesian Abstract Format

ANALYSIS OF THE EFFECT OF LINKAGE LENGTH ON RESPONSE SERIES ACTIVE VARIABLE GEOMETRY SUSPENSION (SAVGS)

Student Name / NRP : Asmone Siswo / 02112040000130

Department : FTIRS Mechanical Engineering -

ITS Supervisor : Instructor's name

and degree

Abstract

Suspension is an important component in motor vehicles because it plays a role important in maintaining comfort and safety when driving. A new idea introduced, namely, *the Active Variable Geometry Suspension (SAVGS) Series*, where This suspension system has better performance than passive suspension and can Overcoming the weaknesses of active suspension. Research continues to be carried out to improve performance of SAVGS. In this research, the influence of *linkage* length will be studied (*single link*) on vehicle performance, especially comfort and stability. Model quarter of the vehicle is used to model the dynamics of the suspension system vehicle. The effect of *single link* length is analyzed in the form of stiffness coefficient and damping coefficient. Linear models are used to design *state-feedback control system* (LQR). The performance of the control system is tested on a nonlinear model created with using Simscape Multibody. The simulation results show that the longer it is If *the single link* is used, the comfort and stability of the vehicle will be greater. However, the longer *the single link* requires greater control input.

Keywords: LQR, Quarter-car, SAVGS, Simscape Multibody

APPENDIX 4: Example of English Abstract Format

ANALYSIS OF THE EFFECT OF LINKAGE LENGTH ON SERIES ACTIVE VARIABLE GEOMETRY SUSPENSION (SAVGS) RESPONSE

Student Name / NRP: Asmone Siswo / 02112040000130

Department : Mechanical Engineering FTIRS - ITS

Advisor : Name of advisor and academic title

Abstract

Suspension is an important component in vehicles because it plays an important role in maintaining comfort and safety while driving. A new idea was introduced, namely, Series Active Variable Geometry Suspension (SAVGS), where this suspension system has better performance than passive suspension and can overcome the weaknesses of active suspension. Research continues to improve the performance of SAVGS. The effect of linkage length (single link) on SAVGS performance, especially comfort and stability, is studied. A quarter car is used to model the dynamics of the vehicle suspension system. The effect of single link length is analyzed in the form of stiffness coefficient and damping coefficient. The linear model is used to design the state-feedback control system (LQR). The performance of the control system was tested on a nonlinear model made using Simscape Multibody. The simulation results show that the longer the single link used, the greater the vehicle's comfort and stability. However, the longer the single link required more considerable control input.

Keywords: *LQR, Quarter-car, SAVGS, Simscape Multibody*

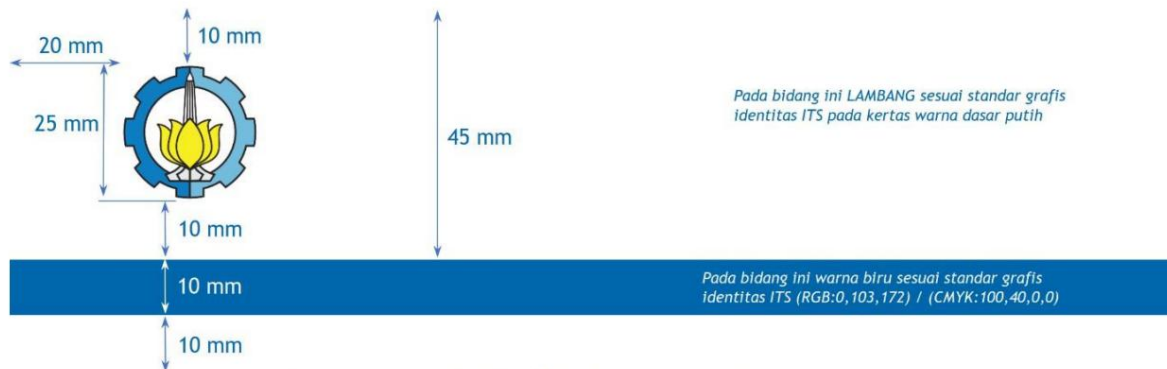
APPENDIX 5: Example of Activity Schedule**SCHEDULE OF ACTIVITIES**

No	Name of activity	Week-													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Literature review														
2	Equipment planning														
3	Field Survey														
3	Experiments														
4	Analysis														
5	Data processing														
6	Progress reporting														
7	Preparation of seminar abstracts														
8	Attend seminars														
9	Preparation of Final Project report														

APPENDIX 6: Example of Final Project Front Cover Page



APPENDIX 7: Example of Final Assignment Title Page in Indonesian



TUGAS AKHIR - QQXXXXXX Trebuchet MS (Bold) 14 pt

JUDUL TUGAS AKHIR DITULIS SINGKAT, JELAS DAN MENGGAMBARAKAN TEMA POKOK

Trebuchet MS (Bold) 18 pt

NAMA MAHASISWA Trebuchet MS (Bold) 14 pt

NRP XXXXXXXXXXXXX Trebuchet MS 14 pt

Dosen Pembimbing Trebuchet MS 14 pt

Nama Pembimbing dan Gelar Trebuchet MS (Bold) 14 pt

NIP XXXXXXXXXXXXX Trebuchet MS 14 pt

Program Studi <Nama Program Studi> Trebuchet MS (Bold) 12 pt

Departemen <Nama Departemen>

Fakultas <Nama Fakultas>

Institut Teknologi Sepuluh Nopember

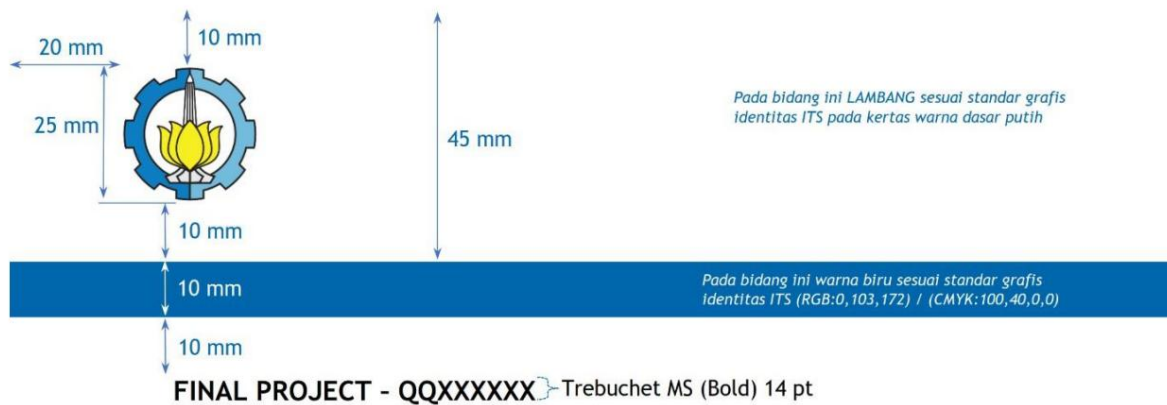
Surabaya

Tahun

Trebuchet MS 12 pt

20 mm

APPENDIX 8: Example of an English Final Assignment Title Page



30 mm

THE TITLE OF THE FINAL PROJECT IS WRITTEN BRIEFLY, CLEARLY AND DESCRIBING THE MAIN THEME

Trebuchet MS (Bold) 18 pt

STUDENT NAME Trebuchet MS (Bold) 14 pt

NRP XXXXXXXXXXXX Trebuchet MS 14 pt

Advisor Trebuchet MS 14 pt

Advisor Name and Academic Title Trebuchet MS (Bold) 14 pt

NIP XXXXXXXXXXXX Trebuchet MS 14 pt

Study Program <Name of Study Program> Trebuchet MS (Bold) 12 pt

Department of <Name of Department>

Faculty of <Name of Faculty>

Institut Teknologi Sepuluh Nopember

Surabaya

Year

Trebuchet MS 12 pt

20 mm

APPENDIX 9: Sample Final Assignment Confirmation Page

SHEET VALIDATION

THE FINAL PROJECT TITLE IS WRITTEN SHORT AND CLEAR
DESCRIBE THE MAIN THEME

THESIS _

Submitted to fulfill one
requirements for obtaining the title <Degree Name>
in the Undergraduate Study Program <Program Name
Studies> Department <Department Name>
Faculty <Faculty Name>

Tenth Institute of Technology
November

By : <NAME

STUDENTS> NRP.

<XXXXXXXXXX>

Approved by the Task Testing Team
End :

- | | |
|---|-----------|
| 1. Name and title of supervisor | Mentor |
| 2. Name and title of co-supervisor/examiner | Co-mentor |
| 3. Name and title of examiner | Examiner |
| 4. Name and title of examiner | Examiner |
| 5. Name and title of examiner | Examiner |

SURABAYA

Month year

APPROVAL SHEET

**THE TITLE OF THE FINAL PROJECT IS WRITTEN BRIEFLY, CLEARLY AND
DESCRIBING THE MAIN THEME**

FINAL PROJECT

Submitted to fulfill one of the requirements
for obtaining a degree <name of degree> at
Undergraduate Study Program of <name of Study Program>
Department of <name of Department>
Faculty of <name of Faculty> Institut
November Tenth Technology

By: **<NAME OF STUDENT>**

NRP. <XXXXXXXXXX>

Approved by Final Project Examiner Team:

- | | |
|---|------------|
| 1. Name of Advisor and academic title | Advisor |
| 2. Name of Co-Advisor/Examiner and academic title | Co-Advisor |
| 3. Name of Examiner and academic title | Examiner |
| 4. Name of Examiner and academic title | Examiner |
| 5. Name of Examiner and academic title | Examiner |

SURABAYA

Month, Year

APPENDIX 10: Example of an Originality Statement Page

STATEMENT OF ORIGINALITY

The undersigned:

Student name / NRP: _____

Department: _____

Supervisor / NIP: _____

hereby declare that the Final Assignment with the title "is the result of _____
your own work, is original, and written following the rules of scientific writing.

If in the future there is a discrepancy with this statement, I am willing to accept sanctions in accordance with the provisions in force at the Sepuluh Nopember Institute of Technology.

Know _____
Surabaya,

Supervisor Student,

(_____)
NIP.

(_____)
NRP.

STATEMENT OF ORIGINALITY

The undersigned below:

Name of student / NRP : _____

Department : _____

Advisor / NIP : _____

hereby declare that the Final Project with the title of “ _____ ” is

the result of my own work, is original, and is written by following the rules of scientific writing.

If in the future there is a discrepancy with this statement, then I am willing to accept sanctions in accordance with the provisions that apply at Institut Teknologi Sepuluh Nopember.

Acknowledged

Surabaya, _____

Advisor

Student

(_____)
NIP.

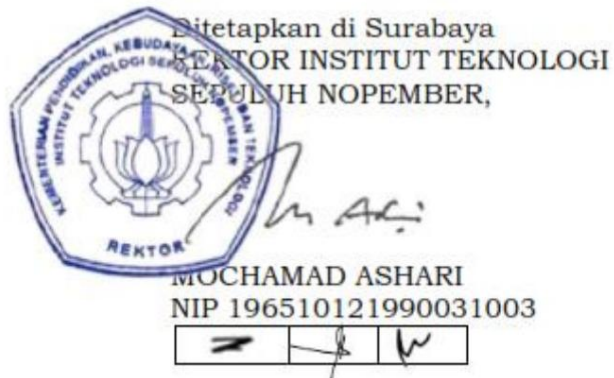
(_____)
NRP.

APPENDIX 11: Example of Author Biodata



Penulis dilahirkan di Madiun, 29 Januari 1985, merupakan anak pertama dari 4 bersaudara. Penulis telah menempuh pendidikan formal yaitu di TK ABA 18 Madiun, SDN Beteng 1 Madiun, SMPN 2 Madiun dan SMAN 2 Madiun. Setelah lulus dari SMAN tahun 2020, Penulis mengikuti SBMPTN dan diterima di Departemen Teknik Mesin FTIRS - ITS pada tahun 2020 dan terdaftar dengan NRP 02112040000130.

Di Departemen Teknik Mesin Penulis sempat aktif di beberapa kegiatan Seminar yang diselenggarakan oleh Departemen, Himpunan Mahasiswa Teknik Mesin (HMM) dan aktif sebagai Asisten Praktikum Mesin Konversi Enersi maupun Grader mata kuliah Termodinamika.



PANDUAN TUGAS AKHIR

FINAL PROJECT GUIDELINE

Program Studi Sarjana (S1) Desain Produk
Bachelor of Industrial Design (BOLD)
2018-2023



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1. PENGERTIAN DAN TUJUAN TUGAS AKHIR

Laporan Tugas Akhir adalah karya ilmiah yang disusun menurut kaidah keilmuan desain dan ditulis berdasarkan kaidah Bahasa Indonesia atau Bahasa Inggris, di bawah pengawasan atau pengarahan dosen pembimbing, untuk memenuhi kriteria-kriteria kualitas yang telah ditetapkan sesuai keilmuan di Program Studi Desain Produk. Tugas Akhir dilaksanakan sebagai salah satu kegiatan akademik dan sebagai persyaratan dalam menyelesaikan program pendidikan sarjana desain produk. Tugas Akhir yang dimaksud dalam pedoman ini mencakup laporan proyek akhir perancangan dan dokumen desain penyerta tugas akhir. Mahasiswa dapat memprogram TA apabila telah lulus minimal 110 SKS, telah lulus studio perancangan 1-5 dan telah melakukan KP.

Tujuan dari penyusunan laporan tugas akhir sesuai dengan **Keputusan Rektor Institut Teknologi Sepuluh Nopember Surabaya Nomor 280/IT2/T/HK.00.01/2022** adalah sebagai berikut :

1. Menerapkan pemikiran logis, kritis, sistematis, dan inovatif dalam konteks pengembangan atau implementasi ilmu pengetahuan dan teknologi
2. Mengkaji implikasi pengembangan atau implementasi ilmu pengetahuan teknologi berdasarkan kaidah, tata cara dan etika ilmiah
3. Mengidentifikasi dan merumuskan masalah penelitian atau ide perancangan (desain) berdasarkan hasil kajian.
4. Menunjukkan kinerja secara mandiri, bermutu, dan terukur dalam melaksanakan penelitian/desain.
5. Menghasilkan solusi, gagasan, desain atau kritik seni.
6. Menyusun deskripsi saintifik hasil kajian yang telah dilakukan ke dalam bentuk skripsi atau laporan tugas/proyek akhir, dan
7. Mempresentasikan dan mempertahankan hasil nya dalam ujian Tugas/Proyek Akhir
8. Mengunggah ringkasan hasil laporan dalam publikasi online ITS (POMITS)

Tugas Akhir adalah bentuk luaran dari karya akhir mahasiswa yang mencakup keseluruhan capaian pembelajaran prodi Desain Produk yaitu :

1. Mampu menyusun konsep desain dengan mengidentifikasi sumber masalah, menganalisis, dan mensintesis kebutuhan dengan mempertimbangkan aspek estetika, kenyamanan dan keselamatan pengguna pada suatu produk
2. Mampu merancang sistem produk dan benda produk berdasarkan penguasaan metoda desain, cara produksi dan sistem distribusi, untuk menghasilkan produk yang dapat dipertanggungjawabkan terhadap kaidah desain, dampak pada lingkungan hidup, dan isu-isu sosial budaya
3. Mampu membuat model untuk menyelesaikan masalah desain yang kompleks secara kreatif berdasarkan prinsip-prinsip desain dan rekayasa, dengan mempertimbangkan faktor ekonomi, keamanan, keselamatan, dan kelestarian lingkungan

4. Melakukan kolaborasi dalam bidang kerja yang multi disiplin dengan memanfaatkan pengetahuan dan kemampuan desainya
5. Memahami konsep teoretis desain: 1. fungsi, 2. estetika, 3. ekonomi, 4. sosial dan, 5. teknologi secara umum
6. Ketrampilan presentasi lisan, tulisan dan multimedia dan teknologi presentasi secara umum
7. Ketrampilan rekabentuk dan visualisasi 2 dan 3 matra secara mendalam
8. Prinsip dan metodologi desain secara mendalam
9. Konsep user centered design secara mendalam
10. Sejarah dan perkembangan desain produk secara mendalam
11. Wawasan budaya dan perkembangan tren secara mendalam
12. Prinsip dan isu terkini dalam teknologi manufaktur secara umum
13. Bisnis dan pemasaran, kewirausahaan, kode etik dan HAKI (Hak atas Kekayaan Intelektual) secara umum
14. Konsep dan prinsip pelestarian lingkungan secara umum

2. RUANG LINGKUP TUGAS AKHIR DESAIN PRODUK

Kompetensi Tugas Akhir adalah mahasiswa mampu implementasi hasil riset dalam lingkup desain produk styling, appliance, furniture atau transportasi yang berbasis data/ kasus nyata secara komprehensif dokumen pra desain (data primer dan data sekunder, aspek ekonomi, teknis, regulasi, standarisasi. Dokumen pra desain yang telah dirumuskan diwujudkan dengan konseptual desain beserta studi, analisis, dan penyelesaian masalah yang dilengkapi dengan dokumen desain berupa sketsa, 3D digital, rendering, laporan, HKI dan Publikasi ilmiah.

Ruang lingkup perancangan pada tugas akhir meliputi :

A. Lingkup Bidang Transportasi

Meliputi : Transportasi masal, transportasi personal, transportasi wisata dan transportasi khusus seperti (Kereta Api, Bus, Kapal, Angkutan Pedesaan, Angkutan Niaga, Sepeda Motor, Sepeda Listrik, Sepeda, Becak, Kendaraan militer, Kendaraan Perkebunan, dsb)

B. Lingkup Bidang Furniture

Meliputi : Furnitur untuk perumahan, furniture perkantoran, furniture set dapur, furniture untuk penjualan dan display produk, furniture rumah sakit, furniture public, dsb.

C. Lingkup Bidang Appliances

Meliputi : peralatan elektronik, peralatan medis, perkakas rumah tangga, dsb

D. Lingkup Bidang Styling

Meliputi : produk gaya hidup, tas, produk alas kaki, produk kerajinan masal, alat atau media permainan, dsb.

Salah satu Luaran akhir Tugas Akhir di Desain Produk ITS Surabaya wajib mengikuti kesetaraan dalam menyajikan purwarupa dalam bentuk Model/ Mock-up/ Prototype.

Tabel 1. Contoh Kesetaraan Luaran Minimum Purwarupa Desain Produk

Tema/ Judul TA	Jumlah Purwarupa	Model/ Mock-up/ Prototype
Transportasi; Mobil, Kereta Api, Kapal, Pesawat, dan produk yang setara	1 unit	Model
Transportasi; Sepeda, Motor, dan produk yang setara	1 unit	Model/ Prototype
Furniture, Workstation, dan produk yang setara	1 unit	Prototype
Peralatan Medis/Kedokteran, Kaki/Tangan Palsu, dan produk yang setara	1 unit	Prototype
Home/Office Apliance, dan produk yang setara	1 set lengkap	Prototype
Peralatan Elektronik, dan produk yang setara	1 set lengkap	Mock-up
Produk Apparel; Alas Kaki, Tas, Costum, Perhiasan, dan produk yang setara	3 unit	Prototype
	3 set lengkap	Prototype
Produk Mainan, Board game, alat Peraga, , dan produk yang setara	1 set lengkap	Prototype
Jam Tangan, dan produk yang setara	3 unit	Prototype

3. WAKTU PELAKSANAAN TUGAS AKHIR

Judul dan Proposal Tugas Akhir dirumuskan pada mata kuliah riset desain pada semester 7 dengan evaluasi akhir berupa Sidang Kolokium 1 yang membahas tentang keluasan dan kedalaman tema perancangan. Urgensi atas permasalahan dan latar belakang yang diangkat sebagai tema tugas akhir disepekatkan dalam siding untuk dilanjutkan menjadi tema perancangan tugas akhir mahasiswa. Selanjutnya Tugas akhir dikerjakan dalam 1 semester sejak pengusulan mata kuliah Tugas Akhir didaftarkan pada Formulir Rencana Studi. Tugas Akhir dikerjakan maksimum dalam 4 semester, apabila mahasiswa tidak lulus dalam 4 semester dengan judul TA yang sama, maka mahasiswa diwajibkan mengganti judul Tugas akhir dan memulai ulang proses Tugas Akhir dari kolokium 1 tanpa harus mengambil mata kuliah riset desain dengan syarat nilai riset desain memiliki kategori lulus.

4. PEMBIMBINGAN TUGAS AKHIR

Berdasarkan Dokumen Panduan Pelaksanaan Tugas Akhir di Lingkungan ITS, jumlah dosen pembimbing Tugas Akhir maksimum 2 (dua) orang sebagai Pembimbing I dan Pembimbing II. Kedua pembimbing mempunyai tanggung jawab dan tugas yang sama dalam proses pembimbingan. Berikut adalah syarat dari pembimbing:

- Kualifikasi akademik minimal S2 dan Asisten Ahli.
- Pembimbing I adalah dosen program studi.
- Pembimbing I memiliki pengetahuan atau pengalaman mengenai bidang keilmuan yang sama dengan tema Tugas Akhir.

d. Pembimbing II dapat berasal dari:

- Dosen Prodi yang sudah pensiun dari ITS dengan kualifikasi minimal S2
- Industri / instansi dengan syarat mempunyai kemampuan setara dengan level 8 KKNI, yaitu:
 - 1) mempunyai kualifikasi akademik minimal Sarjana dalam bidang keahlian yang relevan dengan topik Tugas Akhir, dan
 - 2) sedang/ pernah menjabat sebagai manajer, atau
 - 3) memiliki pengalaman dalam bidangnya minimal 10 (sepuluh) tahun, atau
 - 4) memiliki publikasi dalam jurnal nasional terakreditasi atau jurnal internasional bereputasi

Berdasarkan aturan mengenai Pedoman Operasional Penilaian Angka Kredit, maka setiap semester serang dapat menjadi pembimbing I sebanyak-banyak 8 lulusan, sedangkan pembimbing II sebanyak-banyaknya 4 lulusan.

Proses bimbingan tugas akhir mengikuti jadwal pelaksanaan tahapan tugas akhir. Untuk Pengajuan proposal dan judul tugas akhir mahasiswa diwajibkan melakukan konsultasi ke dosen pembimbing minimal 10 kali sebelum diputuskan siap untuk sidang kolokium 1. Pada kolokium 1 mahasiswa mempersiapkan latar belakang judul beserta kedalaman dan keluasan perancangan, produk planning dilengkapi data primer dan data sekunder hingga menghasilkan DrnO. Untuk Kolokium 2 mahasiswa diwajibkan untuk menyajikan konsep desain beserta alternatif solusinya. Sedangkan Kolokium 3 mahasiswa menyiapkan presentasi display dari luaran desain berupa : (1) Luaran produk / Mock-up/ Prototype, (2) Presentasi , (3) Laporan Tugas Akhir (4) Dokumen desain diantaranya : Sketsa proses, gambar presentasi, gambar Operasional, Gambar teknik, video desain, HKI, dan draft publikasi ilmiah .Untuk siding Akhir / Kolokium 4 mahasiswa harus lulus kolokium 3 yang kemudian dipertanggung jawabkan hasil perancangan tugas akhirnya di siding formal dengan berkas yang diupload pada sistem terintegrasi di <https://thesis.its.ac.id/>.

5. KONTRAK PERKULIAHAN TUGAS AKHIR

Kontrak perkuliahan akan disampaikan pada mahasiswa peserta Tugas Akhir pada perkuliahan Tugas Akhir. Perkuliahan Tugas Akhir memfasilitasi mahasiswa dalam koordinasi dan melaksanakan tugas akhir di desain produk dengan bobot 8 SKS (96ECTS). Kontrak perkuliahan tugas akhir disepakati bersama di Tingkat prodi dan mengikuti kebijakan dari Institut Teknologi Sepuluh Nopember.

Perkuliahan Tugas Akhir sebagai berikut :

1. Perkuliahan mandiri dalam bentuk studio, workshop, asistensi, dan presentasi
2. Pelaksanaan Tugas Akhir dapat menggunakan fasilitas Laboratorium dengan ketentuan yang berlaku di departemen Desain Produk
3. Mahasiswa wajib melakukan konsultasi dan asistensi sekurang-kurangnya 10 kali ke dosen pembimbing
4. Kelengkapan dan Kelayakan Tugas Akhir akan dibantu arahan oleh dosen pengampu Tugas Akhir, untuk proposal Tugas akhir akan menjadi luaran mata kuliah riset desain.

5. Mahasiswa tugas akhir wajib mengikuti tahapan evaluasi Kolokium 1 pada mata kuliah riset desain, dan Kolokium 2, Kolokium 3 dan Kolokium 4 hingga dinyatakan 'diterima/lulus'tugas akhir
6. Mahasiswa mengikuti pameran internal sebagai bentuk Kolokium 3 dan pameran eksternal dalam format pameran 'Bright Future A Head' yang dilaksanakan di luar kampus.
7. Mahasiswa wajib mengikuti tata aturan dan etika penulisan ilmiah berupa orisinalitas
8. Hasil karya Tugas Akhir adalah milik Institut Teknologi Sepuluh Nopember yang secara legal dapat dimanfaatkan untuk kepentingan ITS.

Teknis Pelaksanaan Tugas Akhir di Desain Produk diantaranya :

1. Porto konsep, eksplorasi, eksperimen & proses desain (dibuat format A3; print out art-paper).
2. Gambar sketsa awal (dibuat dalam kertas A3) min 30 lembar.
3. Gambar alternatif desain (dibuat dalam kertas A3) min 5 lembar, bila 3 alternative $3 \times 5 = 15$ lembar. Bila ada 6 final desain $= 6 \times 3 \times 15 = 90$ lembar (transportasi $15 \times 3 = 45$ lembar)
4. Gambar Kerja (skala, hanya untuk final desain), kertas Kalkir A2-print out.
5. Studi Model/Mock-up/Simulasi Digital 3D Model/Hasil eksperimen/eksplorasi (d disesuaikan dg judul riset).
6. Gambar desain (digital), 3D Model & Rendering (dibuat dalam kertas A3 full color)
7. Video Profile Produk 3-5 menit (narasi, animasi assembly/shoot video proses desain, eksperimen, prototype dan tes produk/usability).
8. File presentasi sidang K2 dan K4 (FORMAT POWER POINT/PPT)
9. Membuat model/mock-up/prototype (sesuai judul TA)
10. Membuat Artikel Ilmiah – Jurnal POMMITS/seni dan desain minimal 6 halaman.
11. Membuat Draft HKI; DESAIN INDUSTRI 1 buah.
12. Membuat Draft HKI; Paten Sederhana 1 buah.
13. Membuat Poster A3 (Judul, identitas penulis, Latar Belakang, konsep, hasil desain, simpulan, pustaka)
14. Membuat Standing Banner (deskripsi produk dan hasil desainnya; sketsa-3D model-Proses EksperimenPrototipe)
15. Laporan Tugas Akhir (sesuai standar departemen; cover, lembar pengesahan, format penulisan, sitasi, daftar Pustaka)

6. PROPOSAL TUGAS AKHIR

Pelaksanaan Tugas Akhir dimulai dari tahapan: (i) penyusunan proposal, (ii) pelaksanaan penelitian/pelaksanaan perancangan, (iii) penyusunan laporan, dan (iv) ujian. Susunan Proposal Tugas Akhir tersusun dalam 15 (lima belas) sampai dengan 20 (dua puluh) halaman terdiri dari bagian awal dan bagian isi. Proposal Tugas/Proyek Akhir disusun secara realistis, komprehensif, dan terperinci. Dalam Penyajian Proposal Tugas Akhir di Desain Produk, mahasiswa diwajibkan menyajikan presentasi Konsep Awal dari perancangan berupa presentasi visual gambar 3 dimensi.

1. Bagian Awal Proposal Tugas Akhir

Bagian awal proposal tugas akhir terdiri dari:

- a. Halaman Sampul
- b. Halaman Pengesahan
- c. Abstrak (dalam bahasa Indonesia dan Inggris)
- d. Daftar Isi
- e. Daftar Gambar (jika diperlukan)
- f. Daftar Tabel (jika diperlukan)
- g. Daftar Simbol (jika diperlukan)
- h. Daftar Singkatan (jika diperlukan)

Bagian a sampai dengan h di atas, diberi nomor halaman dengan menggunakan angka romawi, yaitu: i, ii, iii, dst.

2. Halaman Sampul

Sebagai halaman terdepan yang pertama terbaca dari suatu proposal. Halaman Sampul harus dapat memberikan informasi singkat, jelas dan tidak bermakna ganda (ambigu) kepada pembaca tentang isi proposal, yaitu berupa judul, jenis Tugas/Proyek Akhir (penelitian/perancangan (desain)), nama dan NRP mahasiswa, institusi, kota letak institusi dan tahun.

Halaman sampul depan berisi: tulisan "PROPOSAL TUGAS AKHIR", judul Proposal Tugas Akhir, lambang ITS, nama penulis dengan nomor pokok (NRP), nama program studi, nama departemen, nama fakultas, nama institusi (ditulis lengkap dengan huruf besar - INSTITUT TEKNOLOGI SEPULUH NOPEMBER), nama kota (Surabaya), serta tahun pembuatan.

Judul Proposal Tugas/Proyek Akhir harus diketik seluruhnya dengan huruf besar dan tidak boleh disingkat, kecuali singkatan yang sudah baku.

Nama penulis harus ditulis dengan huruf besar dan tidak disingkat.

Contoh halaman sampul proposal tugas akhir ada di **Lampiran 1**.

3. Halaman Pengesahan

Halaman pengesahan diletakkan pada halaman sesudah halaman sampul. Halaman pengesahan berisi: tulisan "LEMBAR PENGESAHAN", judul Proposal Tugas, Nama Mahasiswa, NRP Mahasiswa, tujuan diajukannya Tugas akhir, persetujuan calon

pembimbing dan/atau ko-pembimbing, nama calon pembimbing dan/atau ko-pembimbing, kota, bulan, dan tahun persetujuan.

4. Halaman Abstrak

Halaman ringkasan/abstrak, memuat uraian singkat hal-hal yang akan dikerjakan pada pelaksanaan tugas akhir. Uraian singkat atau abstrak berisi tentang hal-hal yang akan dikerjakan pada pelaksanaan Tugas Akhir yang terdiri dari 200 - 300 kata. Ringkasan rencana penelitian/rencana rancangan/proyek, yang berisi jawaban atas pertanyaan, apa, mengapa, dan bagaimana penelitian/rancangan yang akan dilakukan. Contoh Abstrak atau uraian singkat dalam bahasa Indonesia dan bahasa Inggris masing-masing dapat dilihat pada **Lampiran 3 dan 4**

5. Daftar isi/Gambar/Tabel

Daftar Isi memuat semua bagian tulisan beserta nomor halaman masing-masing, yang ditulis sama dengan isi yang bersangkutan. Daftar isi/gambar/tabel dapat dicetak menggunakan Microsoft words (MS words) secara otomatis dengan menggunakan fitur "Heading" yang diatur sedemikian rupa, sehingga mahasiswa tidak akan kesulitan dengan mengetiknya satu per satu secara manual dengan urutan dari bab atau sub bab, gambar ataupun tabel. Pada bagian Daftar Isi, penulis menginformasikan garis besar bab dan sub bab yang akan mengisi lembaran Tugas Akhir

6. Bagian isi Tugas akhir

Pembagian bab dari pendahuluan sampai metodologi ditentukan oleh fakultas sesuai kebutuhan, atau dengan sistematika sebagai berikut.

Bagian 'Inti/Pokok' atau 'Batang Tubuh' proposal tugas akhir secara umum berisi:

- a. Pendahuluan
 - i. Latar belakang
 - ii. Rumusan Masalah
 - iii. Batasan Masalah atau Ruang Lingkup
 - iv. Tujuan
 - v. Manfaat
- b. Tinjauan Pustaka
 - i. Hasil penelitian/perancangan terdahulu
 - ii. Teori/Konsep dasar
- c. Metodologi
 - i. Metode yang digunakan
 - ii. Bahan dan peralatan yang digunakan
 - iii. Urutan pelaksanaan penelitian
- d. Daftar Pustaka
- e. Lampiran (jika diperlukan)

Nomor urut halaman pada bagian isi proposal, menggunakan angka arab, yaitu: 1, 2, 3, dst. Untuk Tugas Akhir dalam bentuk perancangan/rancang bangun, susunan bagian 'Inti/Pokok' dapat ditentukan oleh fakultas/departemen sesuai dengan kebutuhan.

a. Pendahuluan

Pendahuluan berisi hal-hal yang mendorong atau hal-hal yang melatarbelakangi pentingnya dilakukan penelitian atau perancangan tersebut. Uraian tentang penelitian di bidang ini sangat penting untuk menuju perbaikan atau penyelesaian masalah atau menghasilkan desain. Komponen-komponen dalam bab ini adalah:

i. Latar belakang

Bagian ini secara umum berisi latar belakang dan alasan penulis memilih obyek penelitian/perancangan. Uraian dimulai dengan penjelasan mengenai hal yang bersifat umum terkait dengan topik TA/PA, kemudian diarahkan kepada hal yang lebih khusus yaitu judul proposal TA/PA. Obyek yang akan diteliti harus dijelaskan secara konkret sebagai pengantar menuju permasalahan, dan sebagai hasil kajian/studi terdahulu/ hasil analisis atas data sekunder, tentang obyek yang akan diteliti/dirancang, disertai alasan mengapa masalah tersebut perlu diteliti atau mengapa obyek tersebut perlu dirancang baik secara teoritis maupun praktis.

ii. Rumusan Permasalahan

Permasalahan penelitian/perancangan harus dituliskan dalam bentuk deklaratif atau kalimat-kalimat pertanyaan yang tegas dan jelas. Masalah penelitian/perancangan merupakan perumusan kesenjangan antara keadaan yang ada dengan keadaan yang ingin dicapai. Perumusan masalah dilakukan berdasarkan identifikasi masalah dan ruang lingkup penelitian yang akan dipecahkan atau ruang lingkup obyek yang akan dirancang. Perumusan masalah ini dituangkan dalam bentuk pertanyaan yang nantinya akan dijawab di dalam analisis masalah dengan menggunakan teori atau konsep yang relevan dan didukung oleh data pada pelaksanaan penelitian/perancangan yang akan dilakukan. Dalam merumuskan masalah perlu dihindari mengemukakan banyak pertanyaan, yang artinya bahwa rumusan masalah tidak dituliskan dalam bentuk pertanyaan yang terlalu banyak jumlahnya.

Beberapa program studi dapat menambahkan unsur hipotesis penelitian/perancangan. Hipotesis pada dasarnya merupakan jawaban atau pemecahan sementara atas masalah yang diajukan dalam rumusan masalah TA/PA. Hipotesis penelitian/perancangan dapat dipandang perlu untuk beberapa penelitian/perancangan yang bersifat kekhususan.

iii. Batasan Masalah atau Ruang Lingkup

Ruang lingkup/pembatasan masalah dalam upaya memfokuskan penelitian/perancangan yang akan dilakukan menjadi lebih terarah. Pembatasan dapat dilakukan dari segi keluasan, kedalaman, kemampuan peneliti/perancang dalam aspek tertentu, atau semua segi tersebut. Pembatasan harus disertai alasan atau argumentasi mengapa pembatasan masalah perlu dilakukan. Batasan masalah terkait dengan variable penelitian atau variabel perancangan, variabel dan/atau parameter terhadap variabel penelitian/perancangan, dan/atau variabel/parameter yang diasumsikan sebagai parameter konstanta atau parameter yang diabaikan (O'leary, 2017).

iv. Tujuan Penelitian/Perancangan

Tujuan penelitian/perancangan berisi uraian tentang tujuan penulis melakukan penelitian/perancangan, yaitu untuk menjawab pertanyaan yang telah dituliskan di dalam bagian perumusan masalah atau hasil yang akan dicapai atau jawaban permasalahan penelitian/perancangan. Tujuan penelitian/perancangan dapat dituliskan dalam serangkaian tujuan, yang merupakan tujuan yang lebih spesifik, yang mendukung tujuan penelitian/perancangan. Beberapa prodi dapat menggantikan sub bab Tujuan Penelitian/Perancangan dengan Maksud dan Tujuan Penelitian/Perancangan, dimana kedua terminologi tersebut sering diartikulasikan dalam poin-poin dan umumnya menggunakan pernyataan 'untuk', misalnya:

- ✓ untuk mengembangkan ...;
- ✓ untuk mengidentifikasi ...;
- ✓ untuk mengeksplorasi ...;
- ✓ untuk mengukur ...;
- ✓ untuk menjelaskan ...;
- ✓ untuk menggambarkan ...;
- ✓ untuk membandingkan ...;
- ✓ untuk menentukan ;
- ✓ untuk mengaplikasikan;
- ✓ untuk merancang/mendesain

Dalam menuliskan tujuan, penulis dapat menggunakan prinsip 'SMART'. SMART adalah singkatan untuk spesifik, measurable - terukur, achivable - dapat dicapai, relevan/fokus pada hasil/realistis, dan time bound - terikat waktu. Tujuannya adalah dengan jelas mengartikulasikan apa yang ingin dicapai oleh mahasiswa dalam melaksanakan penelitian/perancangan, atau menjawab masalah penelitian/perancangan yang telah dituliskan sebelumnya.

Bentuk jawaban dari masalah penelitian/perancangan tersebut dapat berupa “hasil pengembangan”, “hasil identifikasi suatu gejala”, “hasil eksplorasi”, “hasil pengukuran”, “hasil penjelasan”, “hasil penerapan”, “hasil membandingkan”, “hasil penerapan”, atau “hasil pembuatan suatu prototipe”, dan lain-lain.

v. Manfaat Penelitian/Perancangan

Pada bagian ini diuraikan secara singkat tetapi jelas kontribusi hasil penelitian/perancangan terhadap pengembangan bidang ilmu, teknologi, seni dan atau terhadap pemecahan persoalan pembangunan, dan atau terhadap pengembangan institusi.

b. Tinjauan Pustaka

Tinjauan pustaka terdiri dari dua bagian, yaitu: (i) hasil penelitian/perancangan terdahulu yang relevan, serta (ii) Landasan dan kerangka teori yang berkaitan dengan permasalahan penelitian/perancangan. Tinjauan pustaka berisi referensi yang terbaru, relevan, dan asli. Tinjauan pustaka adalah bagian spesifik dari tulisan argumentatif yang melibatkan penelitian/perancangan ilmiah dan akademis yang relevan di dalam penelitian/perancangan. Peran tinjauan pustaka adalah menuliskan informasi tentang perkembangan fakta/temuan di lapangan, teori, dan bahan penelitian atau obyek

perancangan lain. Teori yang dituliskan adalah teori yang mendukung dan relevan dengan masalah penelitian/perancangan. Informasi tersebut digunakan untuk membangun kredibilitas penulis dalam membangun pengetahuan, yang diarahkan untuk menyusun kerangka pemikiran atau konsep yang akan digunakan dalam penelitian atau perancangan (O'leary, 2017).

Hasil penelitian/perancangan terdahulu yang relevan merupakan penelitian/perancangan yang pernah dilakukan oleh berbagai pihak, dan apabila memungkinkan bukan hasil pelaksanaan TA/PA terdahulu, melainkan dari jurnal ilmiah, paten, atau laporan perancangan lainnya dari lembaga yang kredibel.

c. Metodologi

Metodologi penelitian/ perancangan/ pembangunan alat adalah cara untuk memecahkan masalah penelitian/ perancangan secara sistematis (Kothari, 2004). Metodologi penelitian/ perancangan/ pembangunan alat memiliki banyak dimensi dan metode penelitian/ perancangan/ pembangunan alat merupakan bagian dari metodologi penelitian/ perancangan/ pembangunan alat. Lingkup metodologi penelitian/ perancangan/ pembangunan alat lebih luas daripada metode penelitian/ perancangan/ pembangunan alat. Dalam metodologi penelitian/ perancangan/ pembangunan alat digunakan pertimbangan logika di balik metode yang digunakan dalam konteks penelitian/perancangan/pembangunan alat, dan menjelaskan mengapa peneliti/perancang menggunakan metode atau teknik tertentu. Metodologi berisi penjelasan untuk mengartikulasikan rencana penelitian/perancangan dengan cukup jelas dan detil. Rencana penelitian/perancangan dapat diilustrasikan dalam bentuk flow chart/tabel dari tahapan dalam penelitian/ perancangan, dalam rangka untuk menjawab masalah penelitian/perancangan (Prabhat, 2015). Metodologi penelitian/ perancangan merupakan garis besar apa yang akan peneliti/perancang lakukan mulai dari menulis hipotesis dan implikasi operasionalnya hingga analisis akhir data. Rencana penelitian/ perancangan dituliskan diantaranya tentang:

- (1) Penelitian/perancangan tentang apa?
- (2) Mengapa penelitian/perancangan dilakukan?
- (3) Dimana penelitian/perancangan akan dilakukan?
- (4) Jenis data apa yang dibutuhkan?
- (5) Dimana data yang dibutuhkan dalam penelitian/perancangan dapat ditemukan?
- (6) Berapa lama dan kapan periode waktu dari data dalam penelitian/perancangan?
- (7) Apa yang akan menjadi sampel dalam penelitian atau obyek perancangan?
- (8) Bagaimana teknik dalam pengumpulan data atau perancangan?
- (9) Bagaimana data akan dianalisis?
- (10) Bagaimana laporan akan disusun?

Bentuk rencana/tahapan di dalam penelitian/perancangan dapat juga memuat tentang bahan-bahan, peralatan, dan cara kerja serta teknik/proses pengerjaan penelitian/perancangan. Bahan adalah material, data, dan hasil penelitian/perancangan lain. Peralatan penelitian/perancangan adalah alat-alat uji laboratorium dan lapangan, perangkat keras dan lunak, atau teori dan persamaan. Proses dalam penelitian/perancangan adalah teknik pengumpulan dan analisa data, model pendekatan yang digunakan, rancangan penelitian atau rancang bangun alat, cara penafsiran dan pengumpulan hasil penelitian, ujicoba peralatan/rancang bangun, cara evaluasi, serta cara penyimpulan. Pada bab ini perlu juga dijelaskan tempat pelaksanaan Tugas/Proyek Akhir.

Apabila Tugas/Proyek akhir sebagai bagian kegiatan “capstone design”, maka di dalam proposal memuat tahapan berikut ini:

- i. Menuliskan masalah riil di lapangan yang akan diselesaikan.
- ii. Menentukan spesifikasi sistem yang akan dirancang untuk memecahkan masalah pada (i).
- iii. Menuliskan semua keputusan yang penting untuk merealisasikan produk yang menjadi bagian dalam (ii).

7. Rencana dan Jadwal Kegiatan

Jadwal kegiatan berisi rincian setiap kegiatan penelitian/perancangan yang dituliskan dalam bentuk tabel, dan diberi tanda (dalam arsir warna yang lebih gelap) dalam satuan minggu. Contoh jadwal kegiatan dapat dilihat pada **Lampiran 5**.

8. Lampiran pendukung

Lampiran pendukung dapat disajikan di akhir proposal berupa bukti atas riset data primer atau proses penelitian tugas akhir yang sedang berlangsung

9. Daftar Pustaka

Daftar pustaka terdiri dari dua, yaitu (i) daftar acuan/referensi, dan (ii) daftar bacaan/bibliografi semua referensi yang diacu dalam proposal. Penulisan daftar pustaka dapat dituliskan hanya daftar acuan saja atau keduanya, yaitu daftar acuan dan daftar bacaan. Judul dari bagian ini adalah Daftar Pustaka. Penjelasan tentang daftar pustaka, dapat dibaca pada sub bab 3.11.

10. Format Proposal

Pengetikan proposal tugas/proyek akhir mengikuti ketentuan sebagai berikut:

- Jenis dan ukuran kertas:
Kertas HVS 80 gram ukuran A4 (210 mm x 297 mm)
- Jarak spasi: 1 (satu/single)
- Jarak tepi (margin):
 - Tepi atas : 3.0 cm
 - Tepi bawah : 2.5 cm
 - Tepi kiri : 3.0 cm
 - Tepi kanan : 2.0 cm
- Jenis huruf :
 - Times New Roman, Normal, ukuran 12 (khusus untuk judul dapat dipakai ukuran 14pt)
 - Kata yang berasal dari bahasa asing yang tidak diterjemahkan ditulis miring (*italic*).

7. LAPORAN TUGAS AKHIR

1. Sistematika

Sistematika Laporan Tugas Akhir mulai dari Bab Pendahuluan sampai Kesimpulan dapat ditentukan oleh fakultas/departemen sesuai dengan kebutuhan, atau dengan sistematika berikut. Sistematika laporan Tugas Akhir terdiri atas tiga bagian besar, yaitu:

A. Bagian 'Awal' terdiri dari:

- 1) Sampul depan dan halaman judul tugas/proyek akhir dalam bahasa Indonesia dan bahasa Inggris (Lampiran 6 – 8)
- 2) Halaman Pengesahan (Lampiran 9)
- 3) Halaman Pernyataan Orisinalitas (Lampiran 10)
- 4) Abstrak atau uraian singkat dalam bahasa Indonesia dan bahasa Inggris (Lampiran 3 – 4)
- 5) Kata pengantar
- 6) Daftar Isi
- 7) Daftar Gambar/Grafik/Diagram
- 8) Daftar Tabel
- 9) Daftar Simbol (jika ada)
- 10) Daftar Singkatan (jika ada)

Penjelasan atas butir-butir di atas sama dengan bagian dalam proposal Tugas Akhir. Daftar isi, daftar gambar, dan daftar tabel dapat dilakukan dengan menggunakan otomasi fitur yang disediakan oleh MS words.

B. Bagian 'Inti/Pokok' atau 'Batang Tubuh' berisi :

- a. Pendahuluan
 - i. Latar belakang
 - ii. Rumusan Permasalahan
 - iii. Batasan Masalah
 - iv. Tujuan
 - v. Manfaat
- b. Tinjauan Pustaka
 - i. Hasil penelitian/perancangan terdahulu
 - ii. Teori/Konsep dasar
- c. Metodologi
 - i. Metode yang digunakan
 - ii. Bahan dan peralatan yang digunakan
 - iii. Urutan pelaksanaan penelitian/perancangan
- d. Hasil dan Pembahasan
 - i. Hasil penelitian/perancangan
 - ii. Pembahasan/Diskusi (analisis, sintesis, dan evaluasi)
- e. Kesimpulan dan Saran
 - i. Berupa hasil penelitian/perancangan yang menjawab permasalahan atau yang berupa konsep, program, dan karya rancangan
 - ii. Saran-saran (jika dianggap perlu), berisi hal-hal yang masih dapat dikerjakan dengan lebih baik dan dapat dikembangkan lebih lanjut, atau berisi masalah-masalah yang dialami pada saat proses pengerjaan tugas/proyek akhir.

Bagian isi dalam laporan Tugas Akhir yang dituliskan pada butir-butir a sd e di atas, sebagian telah dijelaskan pada bab 2 (Proposal Tugas Akhir). Untuk Tugas Akhir dalam bentuk perancangan/ rancang bangun, susunan bagian 'Inti/Pokok' dapat ditentukan oleh fakultas/departemen sesuai dengan kebutuhan.

C. Bagian 'Akhir' terdiri dari:

- a. Daftar Pustaka
- b. Lampiran-lampiran atau Appendiks (jika ada)
- c. Biodata Penulis

2. Format Laporan Tugas Akhir

Pengetikan tugas/proyek akhir harus mengikuti ketentuan sebagai berikut ini:

a. Jenis dan ukuran kertas:

Kertas HVS 80 gram ukuran A4 (210 mm x 297 mm)

b. Jarak spasi : 1 (satu/single)

c. Jarak tepi (margin) :

- Tepi atas : 3.0 cm
- Tepi bawah : 2.5 cm
- Tepi kiri : 3.0 cm
- Tepi kanan : 2.0 cm

d. Jenis huruf

Times New Roman, Normal, ukuran 12.

e. Tabel-tabel dan gambar-gambar, jika ada, sedapat mungkin juga disajikan pada kertas yang sama.

f. Nomor halaman

- Bagian awal diberi halaman dengan angka Romawi dengan huruf kecil (i, ii, iii, iv, v, .. dst)
- Bagian Inti/Pokok atau Batang Tubuh dan Akhir diberi nomor urut dengan angka Arab, dimulai dengan angka 1 dan dimulai dari Bab Pendahuluan sampai dengan lampiran/appendiks.
- Nomor halaman ditulis di bawah (footer) sebelah kanan.

Penomoran halaman dapat dilakukan dengan menggunakan otomasi MS words dalam fitur "insert page number".

g. Tabel dan Gambar

Tabel-tabel diberi nomor urut pada setiap bab dengan angka Arab dengan ketentuan penulisan sbb:

- Nomor terdiri dari 2 bagian, bagian pertama menunjukkan bab sedangkan bagian kedua menunjukkan nomor tabel (contoh: Tabel 2.1, Tabel 3.2, Tabel 3.3, dst).

- Nomor dan Judul Tabel diletakkan di atas tabel serta setiap kata dimulai dengan huruf besar kecuali kata sambung.

Gambar-gambar diberi nomor urut pada setiap bab dengan angka Arab dengan ketentuan penulisan sbb:

- Nomor terdiri dari 2 bagian, bagian pertama menunjukkan bab sedangkan bagian kedua menunjukkan nomor gambar. (contoh: Gambar 2.1, Gambar 3.2, Gambar 3.3, dst).
- Nomor dan Judul Gambar diletakkan di bawah gambar serta setiap kata dimulai dengan huruf besar kecuali kata sambung.

Penomoran tabel dan gambar dapat dilakukan dengan menggunakan otomasi MS words dalam fitur “caption”.

h. Ketebalan kulit muka dan kulit belakang tidak lebih dari 1 mm (soft cover).

i. Halaman Judul

- Bab dan Judul bab: diketik dengan huruf besar semua pada halaman baru dengan jarak seimbang dari tepi kiri dan kanan (center), dan ditebalkan. Nomor bab ditulis dalam huruf Romawi dan judul bab ditulis pada baris berikutnya.
- Sub-judul/ s u b b a b : huruf-huruf pertama setiap kata, kecuali kata sambung, ditulis dengan huruf besar yang ditebalkan dan diletakkan mulai dari tepi kiri.
- Anak sub-judul/sub-sub bab: ditulis mulai dari tepi sebelah kiri dan ditebalkan.
- Huruf pertama dari anak sub-judul ditulis dengan huruf besar.
- Jika masih ada judul dalam tingkatan yang lebih rendah, ditulis seperti pada anak sub-judul.

Pengaturan pada bab, sub bab, sub-sub bab, dst dapat dilakukan dengan menggunakan otomasi MS words dengan melakukan pengaturan pada fitur: “Heading 1”, “Heading 2”, “Heading 3”, dst.

j. Acuan

Semua sumber pustaka yang diacu secara langsung harus dicantumkan. Cara mencantumkan sumber dapat dilihat pada sub bab 3.11. Standar penulisan sumber pustaka yang disitasi di dalam bagian isi Laporan TA, dengan menggunakan standard “APA” - Association Psychology America edisi ke 7. Cara penulisan dapat dilakukan dengan otomasi MS words, dengan menggunakan fitur “References - Manage Source”, atau dengan menggunakan fitur Mendeley Desktop yang telah di instal di dalam MS words. Dengan bantuan software tersebut, maka dapat dilakukan pencetakan daftar pustaka secara otomatis, tanpa mengetik secara manual.

3. Halaman Judul

Halaman sampul depan, berisi: tulisan "TUGAS AKHIR", judul Tugas/Proyek Akhir, logo ITS, nama penulis dengan nomor pokok (NRP), nama program studi, nama departemen, nama fakultas, nama institut (ditulis lengkap dengan huruf besar - INSTITUT TEKNOLOGI SEPULUH NOPEMBER), dan nama kota (Surabaya), serta tahun pembuatan.

Halaman judul berisi : tulisan "TUGAS AKHIR", judul Tugas/Proyek Akhir; lambang ITS, nama penulis dengan nomor pokok (NRP), nama program studi, nama departemen, nama fakultas, nama institut (ditulis lengkap), dan nama kota (Surabaya), serta tahun pembuatan. Halaman judul ditulis dalam bahasa Inggris dan Indonesia dalam halaman yang berbeda.

Judul Tugas/Proyek Akhir harus diketik seluruhnya dengan huruf besar dan tidak boleh disingkat, kecuali singkatan yang sudah baku.

Nama penulis harus ditulis dengan huruf besar dan tidak disingkat.

Contoh halaman sampul depan ada di Lampiran 6 dan halaman judul ada di Lampiran 7 (bahasa Indonesia) dan Lampiran 8 (bahasa Inggris).

4. Halaman Pengesahan

Halaman pengesahan berfungsi untuk menjamin keabsahan hasil karya ilmiah dari tugas akhir. Halaman pengesahan diletakkan pada halaman sesudah halaman judul. Halaman pengesahan berisi: tulisan "LEMBAR PENGESAHAN", judul Tugas Akhir, tujuan diajukannya TA, persetujuan pembimbing dan/atau ko-pembimbing, dan penguji, nama pembimbing dan/atau ko-pembimbing, serta nama penguji, kota, bulan, dan tahun pengesahan. Contoh halaman pengesahan pada Lampiran 9.

5. Halaman Pernyataan Orisinalitas

Halaman ini berisi pernyataan tertulis dari penulis dan diketahui oleh pembimbing yang menyatakan bahwa tugas/proyek akhir yang disusun adalah hasil karyanya sendiri dan ditulis dengan mengikuti kaidah penulisan ilmiah. Contoh Halaman Pernyataan Orisinalitas dapat dilihat pada Lampiran 10.

6. Halaman Abstrak

Halaman abstrak berisi: judul, nama penulis, NRP, nama pembimbing dan/atau nama ko-pembimbing, abstrak dan kata kunci. Halaman abstrak ditulis dalam bahasa Indonesia dan bahasa Inggris dalam halaman yang berbeda. Jumlah kata 200 - 400 kata, termasuk kata kunci. Contoh halaman abstrak dapat dilihat pada Lampiran 3 (bahasa Indonesia) dan Lampiran 4 (bahasa Inggris).

7. Halaman Kata Pengantar

Kata Pengantar tidak lebih dari satu halaman, berisi penjelasan tentang maksud penulisan laporan tugas/proyek akhir, termasuk ucapan terimakasih kepada orang-orang yang punya kontribusi langsung dalam penyusunan Tugas Akhir. Tulisan "KATA PENGANTAR" sebagai judul dari halaman ini dituliskan seluruhnya dengan huruf besar.

Note: Ucapan terima kasih yang ditujukan bagi orang-orang yang memberi kontribusi pada pelaksanaan Tugas Akhir dan belum dimuat di lembar Kata Pengantar, ditulis pada lembar tersendiri dan diletakkan setelah lembar Lampiran.

8. Halaman Daftar Isi

Yang dicantumkan dalam daftar isi: halaman judul, lembar pengesahan, abstrak, kata pengantar, daftar isi, daftar tabel, daftar gambar, daftar simbol, bab sampai dengan anak sub-bab, daftar pustaka, lampiran, semuanya lengkap dengan nomor halaman yang sesuai. Tulisan "DAFTAR ISI" sebagai judul dari halaman ini dituliskan seluruhnya dengan huruf besar.

Isi di dalam daftar isi dapat dilakukan secara otomatis dengan menggunakan fitur pada MS words "References - Table of Contents".

9. Halaman Daftar Gambar

Format penulisan daftar gambar identik dengan format penulisan daftar isi. Tulisan DAFTAR GAMBAR sebagai judul dari daftar gambar dituliskan seluruhnya dengan huruf besar.

Isi di dalam daftar gambar dapat dilakukan secara otomatis dengan menggunakan fitur pada

MS words "References - Insert caption - Table of Figures".

10. Halaman Daftar Tabel

Format penulisan daftar tabel identik dengan format penulisan daftar isi. Tulisan DAFTAR TABEL sebagai judul dari daftar tabel dituliskan seluruhnya dengan huruf besar.

Isi di dalam daftar tabel dapat dilakukan secara otomatis dengan menggunakan fitur pada MS words "References - Insert caption - Table of Figures".

11. Daftar Pustaka

Penulisan daftar pustaka yang diletakkan di bagian akhir isi laporan Tugas Akhir, dilakukan dengan menggunakan standar APA (Association Psychology America) edisi ke 7. Standar penulisan ini digunakan untuk seluruh bidang ilmu, yaitu: sains, teknik, komputing, desain, seni dan yang lain (Southern Institute of Technology, 2020). Pengelompokan pustaka di dalam APA versi 7.0 ini lebih ringkas, dibandingkan dalam APA versi 6.0.

Secara umum penulisan daftar pustaka dalam standar APA, versi 7.0 adalah sebagai berikut:

- 1) Daftar pustaka dimulai pada halaman terpisah dari halaman isi dalam laporan TA/PA.
- 2) Daftar pustaka akan muncul dalam urutan abjad dengan nama belakang penulis pertama.
- 3) Hasil cetak dengan standar APA menggunakan indentasi gantung. Baris ke dua dalam daftar pustaka, menjorok ke dalam di bawah garis ke satu.

- 4) Penulisan kapitalisasi judul hanya di awal kalimat, yang berbeda dengan penulisan judul naskah asli nya.
- 5) Kapitalisasi judul daftar referensi. Gunakan huruf kapital hanya pada huruf pertama dari judul dan subjudul buku, artikel, laporan, bab di halaman web, dan judul majalah yang tidak diterbitkan dalam kapitalisasi huruf pertama dari semua kata penting dalam judul untuk berkala.
- 6) Kutipan dan referensi APA menggunakan ampersand (&) di antara nama belakang penulis, BUKAN "dan". Tetapi jika digunakan nama belakang penulis dalam sebuah kalimat, maka digunakan kata "dan" sesuai dengan aturan penulisan normal.
- 7) Tuliskan DOI dan URL dalam daftar pustaka sebagai hyperlink (yaitu dimulai dengan "http:" atau "https:"). Pengaturan default tampilan di dalam MS Words untuk hyperlink (biasanya font biru, digarisbawahi) atau teks biasa yang tidak digarisbawahi. Sebaiknya tautan ini tetap dapat diakses secara online.
- 8) Beberapa DOI atau URL tertulis secara panjang atau rumit, disini dapat digunakan DOI versi pendek atau URL yang dipersingkat. Untuk merubah DOI versi pendek, dapat menggunakan layanan shortDOI yang disediakan oleh International DOI Foundation (<http://shortdoi.org/>). Masukkan cut and paste DOI dan layanan ini akan membuat shortDOI baru.
- 9) Tidak disarankan (jangan) menyertakan tanggal pengambilan referensi, kecuali jika berasal dari halaman web yang secara inheren dirancang untuk berubah (misalnya entri kamus, profil Twitter, halaman Facebook, peta yang dibuat oleh Google Maps) atau mencerminkan informasi yang berubah dengan berubahnya waktu (situs web yang sering memperbarui informasi, seperti Stats NZ). Disini dapat kita tuliskan tanggal pengambilan, bila diperlukan, sebelum URL, misalnya Diakses pada 2 Desember 2019, dari <https://xxxxx>
- 10) APA edisi 7 TIDAK MEMERLUKAN entry data base: kota, negara bagian (di AS) atau negara tempat buku diterbitkan. Ini adalah perubahan signifikan dari APA edisi ke-6.

Bentuk acuan di dalam APA standar versi 7.0 dibagi dalam 2 (dua) kategori, yaitu: Buku dan artikel yang terbit secara periodik. Cara penulisan di dalam daftar pustaka dan dalam sitasi teks, dijelaskan di dalam bab berikut. Penjelasan ini, secara otomatis dapat tercetak di dalam hasil tulisan dengan menggunakan bantuan MS Worls, dalam fitur "Reference", dengan mode: Style "APA". Apabila menggunakan bantuan otomasi MS Word, maka penulis tidak perlu mengetik secara manual, dan hasilnya akan tertampil baik di dalam teks sebagai sitasi, maupun di dalam daftar acuan sebagai daftar pustaka yang digunakan.

1. Bila referensi berupa Buku

a. **Buku tanpa adanya identitas DOI**, dalam bentuk versi cetak, dan tidak ada versi digital.

Format:

Author, A. A. (year). Title of book. Publisher

Contoh:

Lloyd Owen, D. A. (2018). Smart water technologies and techniques: Data capture and analysis for sustainable water management. John Wiley & Sons.

Cara menulis sitasi:

Menurut Lloyd Owen (2018, p.2) ... atau ... (Lloyd Owen, 2019, p. 2)

b. **Buku dengan DOI atau url**, yang diambil melalui sistem online

- Cantumkan DOI jika tersedia
- Cantumkan URL jika tidak ada DOI dan url dapat diakses oleh semua pembaca

Jangan gunakan URL dari database perpustakaan akademik online, karena pada umumnya tidak dapat diakses oleh semua pembaca, kecuali mahasiswa di universitas tersebut yang dapat login. Tambahkan informasi lain jika tidak ada DOI atau URL yang dapat diakses secara umum, referensinya sama untuk buku cetak.

Buku, dan jika tersedia DOI

Format:

Author, A. A. (year). Title of book. Publisher. <https://doi.org/xxxx>

Contoh:

Cameron-Smith, A. (2019). A doctor across borders: Raphael Cilento and public health from empire to the United Nations. Australian National University Press. <https://doi.org/10.22459/DAB.2019>

Cara menulis sitasi:

Menurut Cameron-Smith (2010, p.17) ... atau ... (Cameron-Smith, 2019, p. 17)

Buku, dengan tidak tersedia DOI tetapi ada URL yang dapat diakses oleh semua pembaca

Format:

Author, A. A. (year). Title of book. Publisher. <https://www...>

Contoh:

Scanlon, V. C., & Sanders, T. (2007). Essentials of anatomy and physiology (5th ed.). F.A. Davis. <https://yhdp.net/uploads/Essentials-of-Anatomy-and-Physiology.pdf>

Cara menulis sitasi:

Menurut Scanlon and Sanders (2007, p.46) ... atau ... (Scanlon & Sanders, 2007, p. 46)

Buku, jika tidak ada DOI dan dapat diakses melalui library online

Format:

Author, A. A. (year). Title of book. Publisher.

Contoh:

Budras, K.-D., Greenough, P. R., Habel, R. E., & Mülling, C. K. W. (2011). Bovine anatomy (2nd ed.). Schlütersche

Cara menulis sitasi:

Budras et al. (2011) menyatakan ... atau ... (Budras et al., 2011)

c. Buku, edisi selain edisi ke 1

Format – print

Author, A. A., & Author, B. B. (year). Title of book (2nd ed.). Publisher.

Contoh:

Marieb, E. N., & Hoehn, K. (2016). Human anatomy & physiology (10th ed.). Pearson.

Cara menulis sitasi:

Menurut Marieb and Hoehn (2016, p. 419) ... atau ... (Marieb & Hoehn, 2016, p. 419)

d. Buku yang diedit, tanpa DOI

Format:

Editor, A. A., & Editor, B. B. (Eds.). (year). Title of book. Publisher.

Contoh:

Lindquist, R., Snyder, M., & Tracy, M. F. (Eds.). (2014). Complementary & alternative therapies in nursing (7th ed.). Springer.

Cara menulis sitasi:

Lindquist et al. (2014) menyatakan ... atau ... (Lindquist et al., 2014)

e. Buku yang diedit dengan DOI

Format:

Editor, A. A. (Ed.). (year). Title of book. Publisher. <https://doi.org/10.xxxx/xxxxxx>

Contoh:

Helbich, M. (Ed.). (2018). Frontiers in mental health and the environment. MDPI. <https://doi.org/10.3390/books978-3-03897-391-1>

Cara menulis sitasi:

Helbich (2018) ... atau ... (Helbich, 2018)

f. Buku dalam bahasa selain bahasa Inggris (sebagai contoh dalam Bahasa Jepang)

Untuk referensi dalam bentuk buku yang ditulis dalam bahasa selain bahasa Inggris, maka penulisan di dalam daftar acuan, dengan cara diberi tanda []

Format:

Author, A. A., & Author, B. B. (year). Title of book [Translation of book title]. Publisher.

Contoh:

Molinari, E., & Labella, A. (2007). *Psicologia clinica: Dialoghi e confronti* [Clinical psychology: Dialogue and confrontation]. Springer.

Amano, N., & Kondo, H. (2003). *Nihongo no goi tokusei* [Lexical characteristics of Japanese Language] (Vol. 7). Sanseido.

Cara menulis sitasi:

Molinari and Labella (2007, p. 25) menyatakan ... atau ... (Molinari & Labella, 2007, p. 25)

Amono and Kondo (2003) menyatakan ... atau... (Amono & Kondo, 2003)

g. Buku yang dipublikasi ulang dalam bentuk terjemahan

Format:

Author, A. A., & Author, B. B. (year). Title of book (T. Translator, Trans.). Publisher. (Original work published year).

Contoh:

Schiller, F. (2018). *Don Carlos infant of Spain: A dramatic poem* (F. Kimmich, Trans.). Open Book. (Original work published 1804).

Cara menulis sitasi:

Schiller (1804/2018, p.19) ... atau ... (Schiller, 1804/2018, p.19)

h. Manual, Versi cetak

Jika penulis dan publisher adalah nama yang sama, maka nama publisher diabaikan.

Contoh:

Brother Industries. (n.d.). Reference guide: Brief explanations for routine operations HS-J6000DW HL- J6100DW. Citation: Brother Industries (n.d., p.1)... OR ... (Brother Industries, n.d., p.1)

i. Manual, yang diakses secara online

Contoh:

World Health Organization. (2019). International statistical classification of diseases and related health problems (11th ed.). <https://icd.who.int/>

Canterbury District Health Board. (2019, January 25). Hand hygiene (Ref. 234641). <http://edu.cdhb.health.nz/Hospitals-Services/Health-Professionals/CDHB-Policies/Infection-Prevention-Control-Manual/Documents/Hand-Hygiene-Policy.pdf>

Cara menulis sitasi:

World Health Organisation (2019) ... atau ... (World Health Organisation, 2019)

Canterbury District Health Board (2019, p. 2) ... atau ... (Canterbury District Health Board, 2019, p.2)

2. Bab di dalam buku yang di edit

a. Bab dari buku yang di edit, dan tidak ada DOI

Format:

Author, A. A. (year). Title of chapter. In B. Editor & C. Editor (Eds.), Title of book (2nd ed., pp. pages of chapter). Publisher.

Contoh:

Casida, J.E. (2010). Pest toxicology: The primary mechanisms of pesticide action. In R. Krieger (Ed.), Hayes' handbook of pesticide toxicology (3rd ed., pp. 103-117). Academic Press.

Cara menulis sitasi:

Casida (2010, p. 105) menyatakan ...
atau ... (Casida, 2010, p. 105)

b. Bab dari buku yang diedit, dan tersedia DOI

Format:

Author, A. A. (year). Title of chapter. In B. Editor & C. Editor (Eds.), Title of book (2nd ed., pp. pages of chapter). Publisher. <https://doi.org/10.xxxx/xxxxxx>

Contoh:

Wall, R., & Rafferty, A. M. (2017). Trouble with "status": Competing models of British and North American public health nursing education and practice in British Malaya. In H. Pols., C.M. Thompson., & J. H. Warner (Eds.), Translating the body: Medical education in Southeast Asia (pp. 67-94). Nuss Press.
<https://doi.org/10.2307/j.ctv1xxzqp>

Cara menulis sitasi:

Wall and Rafferty (2017, p. 82) menyatakan ... atau ... (Wall & Rafferty, 2017, p.82)

c. Kamus, thesaurus, atau ensiklopedia

Jika penulis dan publisher adalah nama yang sama, maka diabaikan publisher. Untuk sumber acuan versi cetak.

Contoh:

Merriam-Webster. (2019). Merriam-Webster's Collegiate Dictionary (11th ed.).

Cara menulis sitasi

Merriam-Webster (2019) ...

atau ... (Merriam-Webster's Collegiate Dictionary, 2019)

Untuk sumber acuan versi online yang diupdate secara kontinyu, sebagai contoh adalah kamus Merriam-Webster.com Dictionary, maka dituliskan “n.d” sebagai tahun publikasi dan sertakan tanggal pengambilan / waktu akses.

Contoh:

Merriam-Webster. (n.d.). Merriam-Webster.com dictionary. Retrieved November 28, 2019, from <https://www.merriam-webster.com/>

Cara menulis sitasi:

Merriam-Webster (n.d.) ... atau
... (Merriam-Webster, n.d.)

3. Artikel yang terbit secara periodik

Artikel yang dipublikasikan secara periodik, termasuk: (i) jurnal, (ii) majalah, (iii) surat kabar, (iv) buletin, (v) blog, dan (vi) platform online lainnya yang menerbitkan artikel. Jurnal dan majalah mempunyai identitas dengan memiliki nomor volume/edisi. Sebagai contoh sebuah jurnal dengan identitas volume 6, nomor 2.

Dalam hal ini nomor volume dicetak miring diikuti oleh nomor dalam tanda kurung tetapi tidak miring. Contoh; 6 (2)

a. Artikel jurnal dengan DOI

Gunakan kapitalisasi kalimat pada judul artikel. Gunakan huruf kapital pada huruf pertama setiap kata utama dalam judul jurnal. Cetak miring judul jurnal dan nomor volume. Tambahkan nomor penerbitan jika tersedia, sertakan nomor DOI; biasanya muncul di halaman pertama artikel.

Format:

Author, A. A., Author, B. B., & Author, C. C. (year). Title of article. Title of Periodical, xx, pp-pp. <https://doi.org/xxxx>

Contoh:

Montayre, J., Dimalapang, E., Sparks, T., & Neville, S. (2019). New Zealand nursing students' perceptions of biosciences: A cross-sectional survey of relevance to practice, teaching delivery, self-competence and challenges. *Nurse Education Today*, 79, 48-53. <https://doi.org/10.1016/j.nedt.2019.05.013>

Cara menulis sitasi:

Berman et al. (2012, p. 537) ... atau ... (Berman et al., 2012, p.537)

b. Artikel jurnal tanpa DOI, dan tidak tersedia url (termasuk url yang hanya bisa diakses oleh kalangan sendiri)

Format:

Author, A. A., Author, B. B., & Author, C. C. (year). Title of article. Title of Periodical, xx, pp-pp. <https://xxxxx>

Contoh:

Akin, D., & Huang, L. M. (2019). Perceptions of college students with disabilities. *Journal of Postsecondary Education and Disability*, 32(1), 21-33. <https://www.ahead.org/professional-resources/publications/jped/archived-jped/jped-volume-32>

Cara menulis sitasi:

Pernyataan dari Akin and Huang (2019, p.21) ...atau ... (Akin & Huang, 2019, p.21)

c. Artikel jurnal tanpa DOI, dari database riset akademik

Artikel jurnal yang ditemukan di database institusi akademik. URL untuk database disediakan sebagai ganti DOI, misalnya <http://ezproxy.sit.ac.nz:xxxxx>
Dalam hal ini jangan menggantikan nama database atau URL.

Contoh:

Whitehead, A., & Gould Fogerite, S. (2017). Yoga treatment for chronic non-specific low back pain. *Explore: The Journal of Science & Healing*, 13(4), 281-284.

Cara menulis sitasi:

Whitehead & Gould Fogerite (2017, p. 282) menyatakan... atau ... (Whitehead & Gould Fogerite, 2017, p. 282)

d. Artikel jurnal dengan DOI, dan jumlah penulis 21 orang atau lebih

Karena DOI asli panjang dan rumit, DOI pendek digunakan. Bentuk DOI yang panjang atau pendek dapat diterima. Daftar 19 penulis pertama, kemudian gunakan ... dan kemudian cantumkan nama penulis terakhir.

Contoh

Gaudinski, M. R., Coates, E. E., Houser, K. V., Chend, G. L., Yamshchikov, G., Saunders, J. G., Holmans, L. A., Gordon, I., Plummer, S., Hendel, C. S., Conan-Cibotti, M., Lorenzo, M., L., Sitar, S., Carlton, K., Laurencot, C., Bailer, R. T., Narpala, S., McDermott, A. B., Namboodirir, A., M., ... Ledgerwood, J. E. (2018). Safety and pharmacokinetics of the Fc-modified HIV-1 human monoclonal antibody VRC01LS: A phase 1 open-label clinical trial in healthy adults. *PLoS Med*, 15(1), e1002493. <https://doi.org/10.1371/journal.pmed.1002493>

e. Artikel jurnal dengan DOI, Penulis secara individu atau dalam group

Contoh:

Eysenbach, G., & CONSORT-EHEALTH Group. (2011). CONSORT-EHEALTH: Improving and standardizing evaluation reports of web-based and mobile health interventions. *Journal of Medical Internet Research*, 13(4), e126. <https://doi.org/10.2196/jmir.1923>

f. Artikel jurnal dalam pers

Artikel dalam pers adalah peer review, dimana artikel diterima dan akan diterbitkan dalam jurnal, tetapi belum ditetapkan ke volume tertentu /edisi tertentu. Meskipun artikel di pers belum memiliki semua rincian bibliografi yang tersedia, artikel ini dapat dikutip menggunakan tahun publikasi online dan DOI.

Contoh:

Kreuzer, M., Cado, V., & Raïes. (2019). Moments of care: How interpersonal interactions contribute to luxury experience of healthcare consumers. *Journal of Business Research*. <https://doi.org/10.1016/j.jbusres.2019.11.033>

g. Artikel pada majalah, online

Penulisan bulan dan tanggal terbit majalah setelah penulisan tahun terbit.

Contoh:

Jousset, P. (2019, November 29). Illuminating earth's faults. *Science*, 366(6469), 1076-1077. <https://science.sciencemag.org/content/366/6469/1076>

Cara menulis sitasi:

Jousett (2019) Atau ... (Jousett, 2019)

h. Artikel dalam surat kabar, online

Artikel di dalam surat kabar online, dapat menjadi salah satu acuan. Cara penulisan dalam bentuk cetak miring, untuk bulan dan tanggal, dan dituliskan setelah penulisan tahun. Reference:

Harding, E. (2019, November 21). Invercargill Kmart ready to open. *The Southland Times*. <https://www.stuff.co.nz/national/117596378/invercargill-kiart-ready-to-open>

Cara menulis sitasi:

Harding (2019) menuliskan atau ... (Harding, 2019)

i. Artikel di dalam webpage - yang dikategorikan bukan surat kabar

Contoh:

Taunton, E. (2019, December 2). Low methane New Zealand sheep coming to a farm near you. *Stuff*. <https://www.stuff.co.nz/business/farming/117862851/low-methane-sheep-coming-to-a-farm-near-you>

Cara menulis sitasi:

Taunton (2019) ... OR ... (Taunton, 2019)

12. Biodata Penulis

Ditulis pada halaman terakhir dan berisi tentang resume penulis, antara lain tempat dan tanggal lahir, riwayat pendidikan, aktivitas yang menonjol, organisasi, prestasi yang pernah diraih, dll. Pada sudut kiri atas ditampilkan foto terbaru closed-up penulis ukuran (4 x 6) cm dan dianjurkan foto warna. Contoh biodata dapat dilihat pada Lampiran 11.

8. DOKUMEN DAN LUARAN TUGAS AKHIR

Dokumen sebagai luaran Tugas Akhir di Desain Produk ITS Surabaya meliputi :

1. Laporan Tugas Akhir
2. Luaran Purwarupa berupa model/ Mock-up/ Prototipe
3. Artikel Jurnal Publikasi Ilmiah untuk POMITS dan Book Chapter.
4. Dokumen Proses Desain berupa sketsa alternatif (45-90 lembar)
5. File 3D Model yang Digambar sesuai kaidah CAD dan CAE
6. Portfolio Tugas Akhir
7. Slide Presentasi untuk Pameran Karya Tugas Akhir
8. Video Porfil Produk
9. Draft HKI (Desain Industri dan Paten Sederhana)

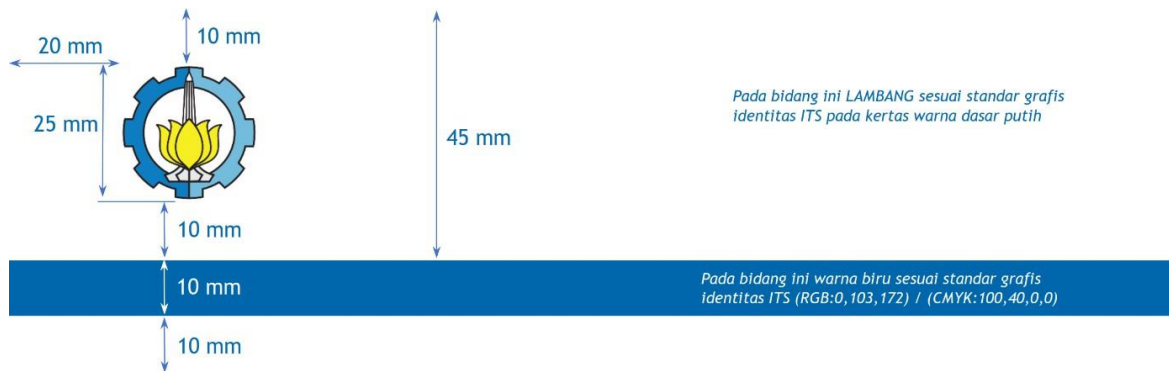
9. EVALUASI TUGAS AKHIR

Pada kolokium 1 mahasiswa mempersiapkan latar belakang judul beserta kedalaman dan keluasan perancangan, produk planning dilengkapi data primer dan data sekunder hingga menghasilkan DrnO. Untuk Kolokium 2 mahasiswa diwajibkan untuk menyajikan konsep desain beserta alternatif solusinya. Sedangkan Kolokium 3 mahasiswa menyiapkan presentasi display dari luaran desain berupa : (1) Luaran produk / Mock-up/ Prototype, (2) Presentasi , (3) Laporan Tugas Akhir (4) Dokumen desain diantaranya : Sketsa proses, gambar presentasi, gambar Operasional, Gambar teknik, video desain, HKI, dan draft publikasi ilmiah .Untuk siding Akhir / Kolokium 4 mahasiswa harus lulus kolokium 3 yang kemudian dipertanggung jawabkan hasil perancangan tugas akhirnya di siding formal dengan berkas yang diupload pada sistem terintegrasi di <https://thesis.its.ac.id/>. Dalam Pelaksanaan Sidang Tugas Akhir terdiri atas pimpinan sidang yaitu 1 dosen pembimbing, dan terdiri minimal 2 penguji tugas akhir. Penilaian Sidang Tugas Akhir pada Kolokium 4 mempertimbangkan kelengkapan Kolokium 3 yang dilaksanakan sebagai pameran. Kriteria Penilaian Tugas akhir mencakup 5 rubrik penilaian diataranya : (1) 40% bobot untuk nilai Model/ Mock-up atau prototype, (2) 20% bobot penilaian untuk kemampuan presentasi dan komunikasi verbal, sikap dan penampilan, (3) 20% bobot untuk dokumen desain secara lengkap dan menyeluruh, (4) 10% bobot untuk penilaian laporan mencakup isi, sistematika, dan tata tulis, (5) 10% Bobot untuk Konsep Desain mencakup : Metodologi, analisis,Konsep dan Kriteria desain termasuk alternatif desain.

DAFTAR PUSTAKA

- Menteri Pendidikan dan Kebudayaan , RI, Permendikbud No 3 2020 ttg Standard Pendidikan Tinggi (SN Dikti) (2020).
- Kothari, C. R. (2004). Resarch Methodology: Methods and Techniques. O'leary, Z. (2017). The Essential Guide to Doing Your Research Project. Prabhat, P. (2015). RESEARCH METHODOLOGY : BRIDGE CENTER. Southern Institute of Technology. (2020). APA Style 7.
- Systems Engineering Course Research Methods; all slides Systems Engineering Course
- Research Methods ; Information. (n.d.).

LAMPIRAN 1: Contoh Halaman Sampul Proposal Tugas Akhir



PROPOSAL TUGAS AKHIR - QQXXXXXX Trebuchet MS (Bold) 14 pt

30 mm **JUDUL PROPOSAL TUGAS AKHIR DITULIS SINGKAT,
JELAS DAN MENGGAMBARAKAN TEMA POKOK**

Trebuchet MS (Bold) 18 pt

NAMA MAHASISWA Trebuchet MS (Bold) 14 pt

NRP XXXXXXXXXXXXX Trebuchet MS 14 pt

Dosen Pembimbing Trebuchet MS 14 pt

Nama Pembimbing dan Gelar Trebuchet MS (Bold) 14 pt

NIP XXXXXXXXXXXXX Trebuchet MS 14 pt

Program Studi <Nama Program Studi> Trebuchet MS (Bold) 12 pt

Departemen <Nama Departemen>

Fakultas <Nama Fakultas>

Institut Teknologi Sepuluh Nopember

Surabaya

Tahun

Trebuchet MS 12 pt

20 mm

LAMPIRAN 2: Contoh Halaman Pengesahan Proposal Tugas Akhir

LEMBAR PENGESAHAN

JUDUL PROPOSAL TUGAS AKHIR DITULIS SINGKAT JELAS DAN MENGGAMBARAKAN TEMA POKOK

PROPOSAL TUGAS AKHIR

Diajukan untuk memenuhi salah satu
syarat memperoleh gelar <Nama
Gelar> pada Program Studi S-1
<Nama Program Studi> Departemen
<Nama Departemen>
Fakultas <Nama Fakultas>
Institut Teknologi Sepuluh
Nopember

Oleh : <NAMA MAHASISWA>
NRP. <XXXXXXXX>

Disetujui oleh Tim Penguji Proposal Tugas Akhir :

- | | |
|---|---------------|
| 1. Nama dan gelar pembimbing | Pembimbing |
| 2. Nama dan gelar ko-pembimbing/penguji | Ko-pembimbing |
| 3. Nama dan gelar penguji | Penguji |
| 4. Nama dan gelar penguji | Penguji |
| 5. Nama dan gelar penguji | Penguji |

Surabaya
Bulan, tahun

APPROVAL SHEET

**THE TITLE OF THE FINAL PROJECT PROPOSAL IS WRITTEN BRIEFLY,
CLEARLY AND DESCRIBING THE MAIN THEME**

FINAL PROJECT PROPOSAL

Submitted to fulfill one of the requirements
for obtaining a degree <name of degree> at
Undergraduate Study Program of <name of Study Program>
Department of <name of Department>
Faculty of <name of Faculty> Institut
Teknologi Sepuluh Nopember

By: <NAME OF STUDENT>

NRP. <XXXXXXXX>

Approved by Final Project Proposal Examiner Team:

- | | |
|---|------------|
| 1. Name of Advisor and academic title | Advisor |
| 2. Name of Co-Advisor/Examiner and academic title | Co-Advisor |
| 3. Name of Examiner and academic title | Examiner |
| 4. Name of Examiner and academic title | Examiner |
| 5. Name of Examiner and academic title | Examiner |

SURABAYA

Month, Year

LAMPIRAN 3: Contoh Format Abstrak Bahasa Indonesia

ANALISA PENGARUH PANJANG LINKAGE TERHADAP RESPON SERIES ACTIVE VARIABLE GEOMETRY SUSPENSION (SAVGS)

Nama Mahasiswa / NRP : Asmone Siswo / 02112040000130
Departemen : Teknik Mesin FTIRS -
ITS Dosen Pembimbing : Nama pembimbing
dan gelar

Abstrak

Suspensi merupakan komponen penting pada kendaraan bermotor karena berperan penting dalam menjaga kenyamanan dan keamanan saat berkendara. Sebuah ide baru diperkenalkan yaitu, *Series Active Variable Geometry Suspension* (SAVGS), dimana sistem suspensi ini memiliki performa yang lebih baik dari suspensi pasif dan dapat mengatasi kelemahan dari suspensi aktif. Penelitian terus dilakukan guna meningkatkan performa dari SAVGS. Pada penelitian ini akan dipelajari pengaruh panjang *linkage* (*single link*) terhadap performa kendaraan khususnya kenyamanan dan stabilitas. Model seperempat kendaraan digunakan untuk memodelkan dinamika sistem suspensi kendaraan. Pengaruh panjang *single link* dianalisis dalam bentuk koefisien kekakuan dan koefisien peredam. Model linier digunakan untuk merancang *state-feedback control system* (LQR). Kinerja sistem kendali diuji pada model nonlinier yang dibuat dengan menggunakan Simscape Multibody. Hasil simulasi menunjukkan bahwa semakin panjang *single link* yang digunakan maka kenyamanan dan stabilitas kendaraan semakin besar. Namun, semakin panjang *single link* diperlukan input kontrol yang lebih besar.

Kata kunci: *LQR, Quarter-car, SAVGS, Simscape Multibody*

LAMPIRAN 4: Contoh Format Abstrak Bahasa Inggris

ANALYSIS OF THE EFFECT OF LINKAGE LENGTH ON SERIES ACTIVE VARIABLE GEOMETRY SUSPENSION (SAVGS) RESPONSE

Student Name / NRP: Asmone Siswo / 02112040000130

Department : Mechanical Engineering FTIRS - ITS

Advisor : Name of advisor and academic title

Abstract

Suspension is an important component in vehicles because it plays an important role in maintaining comfort and safety while driving. A new idea was introduced, namely, Series Active Variable Geometry Suspension (SAVGS), where this suspension system has better performance than passive suspension and can overcome the weaknesses of active suspension. Research continues to improve the performance of SAVGS. The effect of linkage length (single link) on SAVGS performance, especially comfort and stability, is studied. A quarter car is used to model the dynamics of the vehicle suspension system. The effect of single link length is analyzed in the form of stiffness coefficient and damping coefficient. The linear model is used to design the state-feedback control system (LQR). The performance of the control system was tested on a nonlinear model made using Simscape Multibody. The simulation results show that the longer the single link used, the greater the vehicle's comfort and stability. However, the longer the single link required more considerable control input.

Keywords: *LQR, Quarter-car, SAVGS, Simscape Multibody*

LAMPIRAN 5: Contoh Jadwal Kegiatan

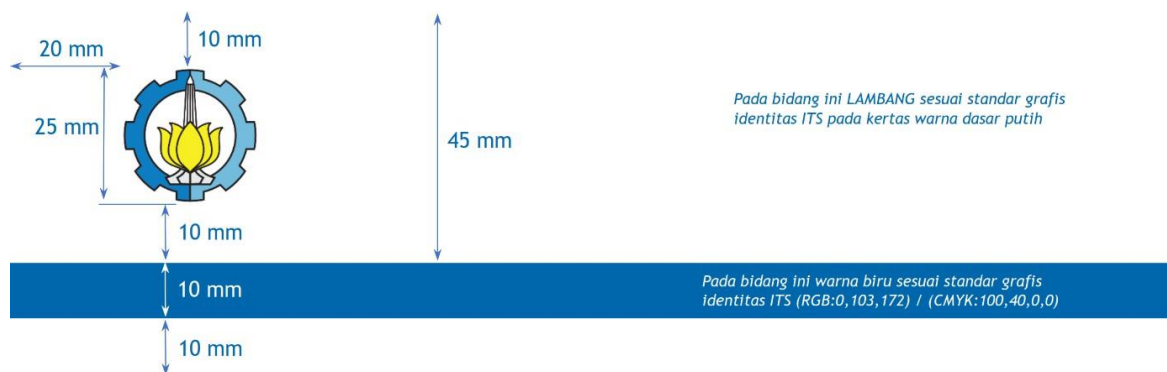
JADWAL KEGIATAN

No	Nama Kegiatan	Minggu ke-													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Studi pustaka														
2	Perancangan peralatan														
3	Survey Lapangan														
3	Eksperimen														
4	Analisa														
5	Pengolahan data														
6	Pelaporan kemajuan														
7	Pembuatan abstrak seminar														
8	Mengikuti seminar														
9	Penyusunan laporan Tugas Akhir														

LAMPIRAN 6: Contoh Halaman Sampul Depan Tugas Akhir



LAMPIRAN 7: Contoh Halaman Judul Tugas Akhir Bahasa Indonesia



TUGAS AKHIR - QQXXXXXX } Trebuchet MS (Bold) 14 pt

30 mm → **JUDUL TUGAS AKHIR DITULIS SINGKAT, JELAS DAN MENGGAMBARAKAN TEMA POKOK**

} Trebuchet MS (Bold) 18 pt

NAMA MAHASISWA } Trebuchet MS (Bold) 14 pt

NRP XXXXXXXXXXXXX } Trebuchet MS 14 pt

Dosen Pembimbing } Trebuchet MS 14 pt

Nama Pembimbing dan Gelar } Trebuchet MS (Bold) 14 pt

NIP XXXXXXXXXXXXX } Trebuchet MS 14 pt

Program Studi <Nama Program Studi> } Trebuchet MS (Bold) 12 pt

Departemen <Nama Departemen>

Fakultas <Nama Fakultas>

Institut Teknologi Sepuluh Nopember

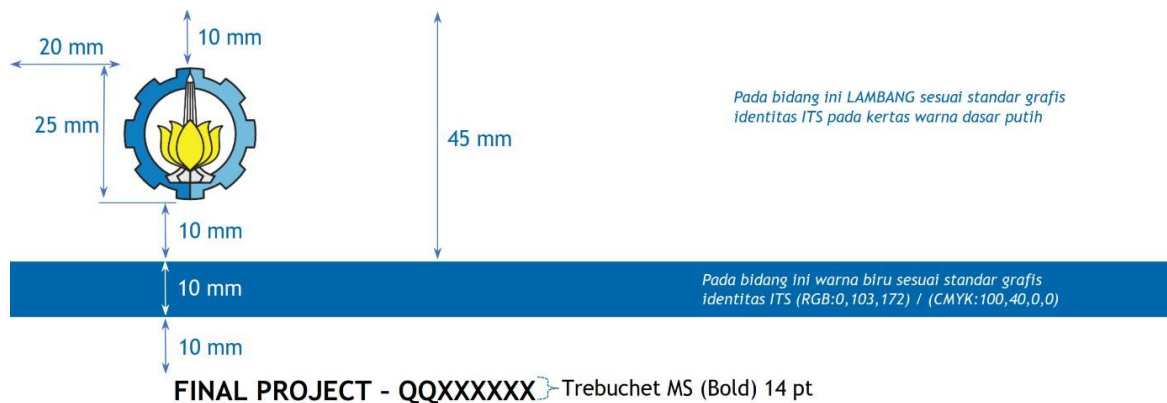
Surabaya

Tahun

} Trebuchet MS 12 pt

20 mm

LAMPIRAN 8: Contoh Halaman Judul Tugas Akhir Bahasa Inggris



30 mm

THE TITLE OF THE FINAL PROJECT IS WRITTEN BRIEFLY, CLEARLY AND DESCRIBING THE MAIN THEME

Trebuchet MS (Bold) 18 pt

STUDENT NAME Trebuchet MS (Bold) 14 pt

NRP XXXXXXXXXXXX Trebuchet MS 14 pt

Advisor Trebuchet MS 14 pt

Advisor Name and Academic Title Trebuchet MS (Bold) 14 pt

NIP XXXXXXXXXXXX Trebuchet MS 14 pt

Study Program <Name of Study Program> Trebuchet MS (Bold) 12 pt

Department of <Name of Department>

Faculty of <Name of Faculty>

Institut Teknologi Sepuluh Nopember

Surabaya

Year

Trebuchet MS 12 pt

20 mm

LAMPIRAN 9: Contoh Halaman Pengesahan Tugas Akhir

LEMBAR PENGESEAHAN

**JUDUL TUGAS AKHIR DITULIS SINGKAT JELAS DAN
MENGGAMBARAKAN TEMA POKOK**

TUGAS AKHIR

Diajukan untuk memenuhi salah satu
syarat memperoleh gelar <Nama Gelar>
pada Program Studi S-1 <Nama Program
Studi> Departemen <Nama Departemen>
Fakultas <Nama Fakultas>
Institut Teknologi Sepuluh
Nopember

Oleh : <NAMA
MAHASISWA> NRP.
<XXXXXXXXXX>

Disetujui oleh Tim Penguji Tugas
Akhir :

- | | |
|---|---------------|
| 1. Nama dan gelar pembimbing | Pembimbing |
| 2. Nama dan gelar ko-pembimbing/penguji | Ko-pembimbing |
| 3. Nama dan gelar penguji | Penguji |
| 4. Nama dan gelar penguji | Penguji |
| 5. Nama dan gelar penguji | Penguji |

SURABAYA

Bulan, Tahun

APPROVAL SHEET

**THE TITLE OF THE FINAL PROJECT IS WRITTEN BRIEFLY, CLEARLY AND
DESCRIBING THE MAIN THEME**

FINAL PROJECT

Submitted to fulfill one of the requirements
for obtaining a degree <name of degree> at
Undergraduate Study Program of <name of Study Program>
Department of <name of Department>
Faculty of <name of Faculty> Institut
Teknologi Sepuluh Nopember

By: <NAME OF STUDENT>
NRP. <XXXXXXXX>

Approved by Final Project Examiner Team:

- | | |
|---|------------|
| 1. Name of Advisor and academic title | Advisor |
| 2. Name of Co-Advisor/Examiner and academic title | Co-Advisor |
| 3. Name of Examiner and academic title | Examiner |
| 4. Name of Examiner and academic title | Examiner |
| 5. Name of Examiner and academic title | Examiner |

SURABAYA
Month, Year

LAMPIRAN 10: Contoh Halaman Pernyataan Orisinalitas

PERNYATAAN ORISINALITAS

Yang bertanda tangan di bawah ini:

Nama mahasiswa / NRP : _____

Departemen : _____

Dosen Pembimbing / NIP: _____

dengan ini menyatakan bahwa Tugas Akhir dengan judul “_____” adalah hasil karya sendiri, bersifat orisinal, dan ditulis dengan mengikuti kaidah penulisan ilmiah.

Bilamana di kemudian hari ditemukan ketidaksesuaian dengan pernyataan ini, maka saya bersedia menerima sanksi sesuai dengan ketentuan yang berlaku di Institut Teknologi Sepuluh Nopember.

Mengetahui
Surabaya, _____

Dosen Pembimbing
Mahasiswa,

(_____)
NIP.

(_____)
NRP.

STATEMENT OF ORIGINALITY

The undersigned below:

Name of student / NRP : _____

Department : _____

Advisor / NIP : _____

hereby declare that the Final Project with the title of “_____” is

the result of my own work, is original, and is written by following the rules of scientific writing.

If in the future there is a discrepancy with this statement, then I am willing to accept sanctions in accordance with the provisions that apply at Institut Teknologi Sepuluh Nopember.

Acknowledged _____
Surabaya,

Advisor Student

(_____)
NIP.

(_____)
NRP.

LAMPIRAN 11: Contoh Biodata Penulis



Penulis dilahirkan di Madiun, 29 Januari 1985, merupakan anak pertama dari 4 bersaudara. Penulis telah menempuh pendidikan formal yaitu di TK ABA 18 Madiun, SDN Beteng 1 Madiun, SMPN 2 Madiun dan SMAN 2 Madiun. Setelah lulus dari SMAN tahun 2020, Penulis mengikuti SBMPTN dan diterima di Departemen Teknik Mesin FTIRS - ITS pada tahun 2020 dan terdaftar dengan NRP 02112040000130.

Di Departemen Teknik Mesin Penulis sempat aktif di beberapa kegiatan Seminar yang diselenggarakan oleh Departemen, Himpunan Mahasiswa Teknik Mesin (HMM) dan aktif sebagai Asisten Praktikum Mesin Konversi Enersi maupun Grader mata kuliah Termodinamika.



Ditetapkan di Surabaya
REKTOR INSTITUT TEKNOLOGI
SEPULUH NOPEMBER,

MOCHAMAD ASHARI
NIP 196510121990031003

