COLLEGE OF ENGINEERING AND AGRO-INDUSTRIAL TECHNOLOGY
UNIVERSITY OF THE PHILIPPINES LOS BAÑOS

FORMATTING GUIDELINES for UNDERGRADUATE THESIS, FIELD PRACTICE and SPECIAL PROBLEM MANUSCRIPTS

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6th Edition

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Contents

Article 1

General Guidelines[1]

Section 1.1. General Format

The formatting provisions stated under this article are hereby defined as the “general format” and shall be used throughout the whole manuscript. Deviations from these provisions are stated in specific sections or paragraphs in subsequent articles.

Section 1.2. Paper Size and Dimensions

All manuscripts shall be printed in “letter size” white bond paper. Such paper should have a nominal height of 11 inches (279.4 mm), a nominal width of 8.5 inches (215.9 mm) and a weight not less than 80 grams per square meter (gsm).

Section 1.3. Page Margin

The measurement of margins shall be reckoned from the edge of the page. The following margins shall apply:

Top:	1 inch (2.54 cm)
Bottom:	1 inch (2.54 cm)
Right:	1 inch (2.54 cm)
Left:	1.5 inches (3.81 cm)

Section 1.4. Font Characteristics

Unless stated otherwise, the following font characteristics shall be applied to the whole manuscript (including page numbers):

Face:	Times New Roman	
Size:	12	
Color:	Black	
Style:	Regular	(NOT “**bold**”, “*italicized*” nor “underlined”)
Scale:	100%	(NOT “<100%” nor “>100%”)
Spacing:	Normal	(NOT "expanded" nor "condensed")
Position:	Normal	(NOT "raised" nor "lowered")

[1] Throughout this document, provisions containing the word ’shall’ are to be strictly followed (mandatory). On the other hand, provisions containing the word ’should’ may be interpreted as ’preferred or recommendatory’ provisions in which slight deviations are permitted, provided that mandatory provisions are still upheld.

Section 1.5. Paragraph Alignment

1.5.a. Unless stated otherwise, all paragraphs shall be justified, i.e. they shall be aligned to both left and right margins (see Example **1.5.b.**).

1.5.b. Example **1.5.b.**

College of Engineering and Agro-Industrial Technology. Institute of Agricultural and Biosystems Engineering. Department of Chemical Engineering. Department of Civil Engineering. Department of Electrical Engineering. Department of Industrial Engineering. Department of Engineering Science.

College of Engineering and Agro-Industrial Technology. Institute of Agricultural and Biosystems Engineering. Department of Chemical Engineering. Department of Civil Engineering. Department of Electrical Engineering. Department of Industrial Engineering. Department of Engineering Science.

Article 2

Manuscript External Design and Structure

Section 2.1. Manuscript Binding

Thesis, Field Practice and Special Problem manuscripts shall be hardbound before submission. Manuscripts bound using other binding methods (soft bound, ring bound, etc) shall not be accepted.

Section 2.2. Cover Color and Covering

2.2.a. Thesis manuscripts shall be covered with maroon hardbound book cover. Field practice manuscripts shall be covered with dark blue hardbound book cover. Special Problem manuscripts shall be covered with chocolate brown hardbound book cover. Crocodile-skin covers shall not be used.

2.2.b. Thesis, Field Practice and Special Problem manuscripts shall be covered with transparent plastic for added protection.

Section 2.3. Letter Color

All letters to be engraved in the manuscript spine and front cover shall be gold in color, pressed against the maroon, dark blue or chocolate brown cover.

Section 2.4. Design and Layout of the Front Cover

2.4.a. The front cover page shall contain the following information:

- **2.4.a.1.** Full thesis, field practice or special problem title
- **2.4.a.2.** Full name of the author
- **2.4.a.3.** Degree
- **2.4.a.4.** Major (if any)
- **2.4.a.5.** Date of manuscript submission

2.4.b. The title shall be in uppercase letters (except for scientific names), center-aligned in the page and shall be laid out in an inverse pyramid manner. The first line of the title should be spaced about two (2) inches below the top edge of the front cover.

2.4.c. It should be emphasized that the student and the guidance committee have the inherent responsibility to ensure that the manuscript title adheres to accepted practices in indexing and style, including the proper use of scientific names and appropriate placement of names of places and institutions (and their acronyms) in the title.

2.4.d. For titles containing names of places in the PHILIPPINES, the term "PHILIPPINES" should be added after the name of the place. The level of citing the place shall include city/municipality, followed by province, then PHILIPPINES. For titles already containing the word "PHILIPPINES" such as company names or institutions, then the word "PHILIPPINES" may not be again written to avoid redundancy. In this case the place to be written in the title is up to province only. If a well-known company or institution has no other branches, then only "PHILIPPINES" will be included in the title (city/municipality and province is not necessary at all). The members of the guidance committee shall ensure that this provision is strictly followed.

2.4.e. For titles containing scientific names of organisms the author shall secure a certification from the Museum of Natural History (MNH-UPLB) at least five (5) working days prior to submission to the guidance committee. The certification shall state the accepted and correct scientific name of the organism. The certification must be included as part of the Appendix. Furthermore, the author shall follow the recommendation of the MNH on how the scientific name should be written and positioned in the title and in the body of the manuscript. Scientific names should only be written when the object of the study pertains to plants, animals or bio-material/products. The members of the guidance committee shall ensure that this provision is strictly followed.

2.4.f. For titles containing company names or institutions with acronyms, the spelled out acronym followed by the acronym itself enclosed in a parenthesis shall be included in the title. The name of the company (and its acronym if applicable) to be used in the whole manuscript shall conform to the name approved by the company as stated in the form 'CONSENT TO USE COMPANY NAME IN MANUSCRIPT' (see CEAT Form 1.4). This form shall only be used as reference for the verification of the manuscript title and shall NOT be a part of the manuscript. It shall be kept by the student, department/division and the office of the college secretary with confidentiality. This form is to be submitted to the College Secretary's Office together with CEAT Forms 1.1 to 1.3 at the start of the semester.

2.4.g. The author's name shall be written in full, first name first, followed by middle name (not middle initial), and then surname. It shall be presented in uppercase letters, center-aligned in the page, and in single line only. The author's name should be positioned five (5) inches below the top edge of the front cover.

2.4.h. The degree shall be written in full, (e.g. BACHELOR OF SCIENCE IN AGRICULTURAL AND BIOSYSTEMS ENGINEERING not B.S. AGRICULTURAL AND BIOSYSTEMS ENGINEERING nor BS AGRICULTURAL AND BIOSYSTEMS ENG'G), in uppercase letters, center-aligned in the page, and in single line only. The degree should be positioned about 3.5 inches above the bottom edge of the front cover.

2.4.i. The major shall be written below the degree, in title case (i.e. the first letter of all significant words capitalized), and center-aligned in the page. The major shall be enclosed in parenthesis and shall be introduced by the phrase "Major in" followed by the major.

2.4.j. For consistency, the following terms shall be used to indicate the major of the author:

2.4.j.1. Majors for BS Agricultural and Biosystems Engineering

- Agricultural Machinery and Power Engineering
- Agricultural and Bio-Process Engineering
- Land and Water Resources Engineering
- Structures and Environment

2.4.j.2. Majors for BS Chemical Engineering

- Sugar Technology
- Pulp and Paper Technology

2.4.j.3. Majors for BS Electrical Engineering

- Power Engineering
- Electronics Engineering
- Computer Engineering

2.4.k. The line for the major shall be omitted for students under the following curricula:

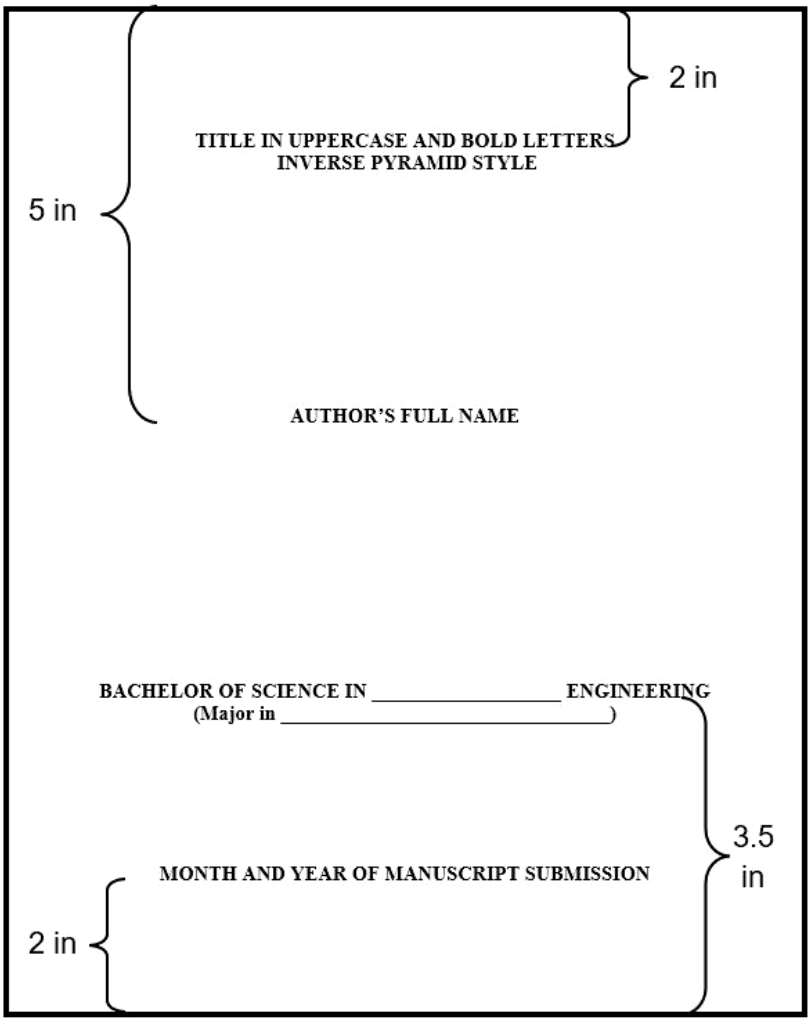
2.4.k.1. Bachelor of Science in Chemical Engineering (General Curriculum)

2.4.k.2. Bachelor of Science in Civil Engineering

2.4.k.3. Bachelor of Science in Industrial Engineering

2.4.l. The date of manuscript submission shall correspond to the month and year when the numerical grade of the student in his or her thesis/field practice/special problem is submitted by his or her adviser to the office of the college secretary. It shall be written in uppercase letters and center-aligned in the page (e.g. for first semester: DECEMBER 2015; for second semester: JUNE 2016; for mid-year: JULY 2016). It should be emphasized that even if the student submitted his or her manuscript at the start or middle of the semester, the date of manuscript submission shall still be the month and year when his or her numerical grade was submitted to the office of the college secretary, which is usually at the end of the semester/term. This date should be positioned about two (2) inches above the bottom edge of the front cover (see Pattern **2.4.m.** and Example **2.4.n.**).

2.4.m. Pattern **2.4.m.**



2.4.n. Example **2.4.n.**

Section 2.5. Design and Layout of the Manuscript Spine

2.5.a. The manuscript spine shall contain the following information:

- **2.5.a.1.** First letter of the author's surname
- **2.5.a.2.** Acronym of the degree
- **2.5.a.3.** Surname and initials of the author
- **2.5.a.4.** Year of manuscript submission

2.5.b. The top and bottom edges of the spine shall be bordered by two gold lines as indicated in Pattern **2.5.h.**

2.5.c. The first letter of the author's surname shall be bordered by two gold lines positioned one (1) inch below the top edge of the spine. The letter should be centered between these lines and the lines at the top edge of the spine (see Pattern **2.5.h.**).

2.5.d. The acronym of the degree (BS____) should be positioned about two (2) inches below the top edge of the spine.

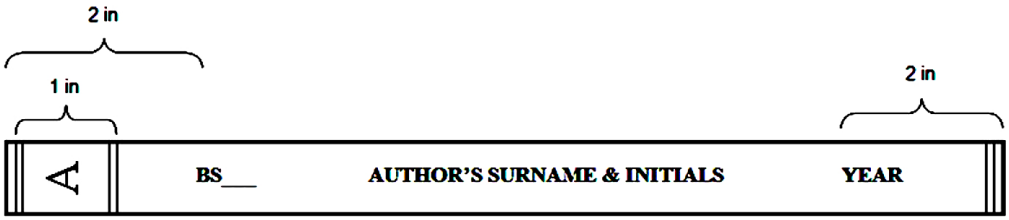
2.5.e. For consistency, the following terms shall be used to indicate the acronym of the different degrees:

2.5.e.1. BSABE for BS in Agricultural and Biosystems Engineering
2.5.e.2. BSChE for BS in Chemical Engineering
2.5.e.3. BSCE for BS in Civil Engineering
2.5.e.4. BSEE for BS in Electrical Engineering
2.5.e.5. BSIE for BS in Industrial Engineering

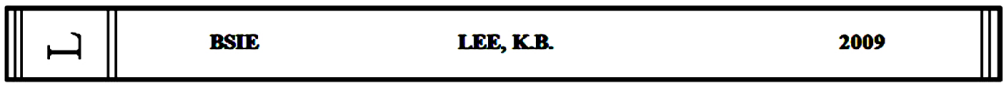
2.5.f. The year of manuscript submission should be positioned about two (2) inches above the bottom edge of the spine.

2.5.g. The author's name shall be written in reverse, surname first, followed by a comma, first name initials and middle initial. It shall be in uppercase letters and centered between the acronym of the degree and the year of manuscript submission.

2.5.h. Pattern **2.5.h.**



2.5.i. Example **2.5.i.**



Article 3

Preliminary Pages

Section 3.1. Contents of the Preliminary Pages

3.1.a. The preliminary pages for thesis manuscripts (arranged according to their order of presentation in the text) include the following:

3.1.a.1. TITLE PAGE
3.1.a.2. APPROVAL PAGE
3.1.a.3. BIOGRAPHICAL SKETCH
3.1.a.4. ACKNOWLEDGMENT
3.1.a.5. TABLE OF CONTENTS
3.1.a.6. LIST OF TABLES
3.1.a.7. LIST OF FIGURES
3.1.a.8. LIST OF APPENDICES[1]
3.1.a.9. LIST OF APPENDIX TABLES
3.1.a.10. LIST OF APPENDIX FIGURES
3.1.a.11. ACRONYMS AND ABBREVIATIONS (if applicable)
3.1.a.12. ABSTRACT

3.1.b. The preliminary pages for field practice and special problem manuscripts (arranged according to their order of presentation) include the following:

3.1.b.1. TITLE PAGE
3.1.b.2. APPROVAL PAGE
3.1.b.3. BIOGRAPHICAL SKETCH
3.1.b.4. ACKNOWLEDGMENT
3.1.b.5. TABLE OF CONTENTS
3.1.b.6. LIST OF TABLES
3.1.b.7. LIST OF FIGURES

3.1.b.8. LIST OF APPENDICES[1]

3.1.b.9. LIST OF APPENDIX TABLES

3.1.b.10. LIST OF APPENDIX FIGURES

3.1.b.11. ACRONYMS AND ABBREVIATIONS (if applicable)

3.1.b.12. EXECUTIVE SUMMARY

3.1.c. Each preliminary page shall be started on a new page, regardless of the space left in the previous page.

Section 3.2. Title Page

3.2.a. The title page shall contain the following information:

3.2.a.1. Full thesis, field practice or special problem title

3.2.a.2. Full name of the author

3.2.a.3. Statement of submission

3.2.a.4. Degree

3.2.a.5. Major

3.2.a.6. Date of manuscript submission

3.2.a.7. Statement of manuscript content disclosure

3.2.b. All items found in the title page shall be presented in bold letters.

3.2.c. The title shall be in uppercase letters (except for scientific names), center-aligned in the page and shall be laid out in an inverse pyramid manner. The first line of the title shall be positioned at the topmost line of the page.

3.2.d. It should be emphasized that the student and the guidance committee have the inherent responsibility to ensure that the manuscript title adheres to accepted practices in indexing and style, including the proper use of scientific names and appropriate placement of names of places and institutions (and their acronyms) in the title.

3.2.e. For titles containing names of places in the PHILIPPINES, the term "PHILIPPINES" should be added after the name of the place. The level of citing the place shall include city/municipality, followed by province, then PHILIPPINES. For titles already containing the word "PHILIPPINES" such as company names or institutions, then the word "PHILIPPINES" may not be again written to avoid redundancy. In this case, the place to be written in the title is up to province only. If a well-known company or institution has no other branches, then only "PHILIPPINES" will be included in the title (city/municipality and province is not necessary at all). The members of the guidance committee shall ensure that this provision is strictly followed.

3.2.f. For titles containing scientific names of organisms, the author shall secure a certification from the Museum of Natural History (MNH-UPLB) at least five (5) working days prior to submission to the guidance committee. The certification shall state the accepted and correct scientific name of the organism. The certification must be included as part of the Appendix. Furthermore, the author shall follow the recommendation of the MNH on how the scientific name should be written and positioned in the title and in the body of the manuscript. Scientific names should only be written when the object of the study pertains to plants, animals or bio-material/products. The members of the guidance committee shall ensure that this provision is strictly followed.

3.2.g. For titles containing company names or institutions with acronyms, the spelled out acronym followed by the acronym itself enclosed in a parenthesis shall be included in the title. The name of the company (and its acronym if applicable) to be used in the whole manuscript shall conform to the name approved by the company as stated in the form 'CONSENT TO USE COMPANY NAME IN MANUSCRIPT' (see CEAT Form 1.4). This form shall only be used as

[1] This should be changed to 'APPENDIX' if there is only one appendix section in the manuscript.

reference for the verification of the manuscript title and shall NOT be a part of the manuscript. It shall be kept by the student, department/division and the office of the college secretary with confidentiality. This form is to be submitted to the College Secretary's Office together with CEAT Forms 1.1 to 1.3 at the start of the semester.

3.2.h. The author's name shall be written in full, first name first, followed by middle name (not middle initial), and then surname. It shall be presented in uppercase letters, center-aligned in the page, and in single line only. The author's name shall be positioned about ten (10) spaces below the first line of the title.

3.2.i. The statement of submission shall be in uppercase letters, center-aligned in the page and stated according to the format and layout illustrated in Pattern **3.2.k.** The first line in the statement of submission should be positioned about five (5) spaces below the name of the author.

3.2.j. For BSABE students, the blank line in Pattern **3.2.k.** shall correspond to the academic division where the author belongs. For consistency, the following names shall be used to indicate the divisions:

3.2.j.1. AGRICULTURAL AND BIO-PROCESS DIVISION

3.2.j.2. AGRICULTURAL MACHINERY DIVISION

3.2.j.3. AGROMETEOROLOGY AND FARM STRUCTURES DIVISION

3.2.j.4. LAND AND WATER RESOURCES DIVISION

3.2.k. Pattern **3.2.k.**

SUBMITTED TO THE FACULTY OF THE

_____

DEPARTMENT OR INSTITUTE[2]
COLLEGE OF ENGINEERING AND AGRO-INDUSTRIAL TECHNOLOGY
UNIVERSITY OF THE PHILIPPINES LOS BAÑOS
IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE
DEGREE OF

3.2.l. For non-BSABE students, the blank line in Pattern **3.2.k.** shall be omitted in the statement of submission.

3.2.m. The degree shall be written in full, (e.g. BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING not B.S. ELECTRICAL ENGINEERING nor BS ELECTRICAL ENG'G), in uppercase letters, center-aligned in the page, and in single line only. The degree should be positioned about eight (5) spaces below the last line of the statement of submission.

3.2.n. The major shall be written below the degree, in title case (i.e. the first letters of all significant words are capitalized), and center-aligned in the page. The major shall be enclosed in parenthesis and shall be introduced by the phrase "Major in" followed by the major.

3.2.o. For consistency, the following terms shall be used to indicate the major of the author:

3.2.o.1. Majors for BS Agricultural and Biosystems Engineering

- Agricultural Machinery and Power Engineering
- Agricultural and Bio-Process Engineering
- Land and Water Resources Engineering
- Structures and Environment

[2] Be sure to change this line according to your department or institute.

3.2.o.2. Majors for BS Chemical Engineering

- Sugar Technology
- Pulp and Paper Technology

3.2.o.3. Majors for BS Electrical Engineering

- Power Engineering
- Electronics Engineering
- Computer Engineering

3.2.p. The line for the major shall be omitted for students under the following curricula:

3.2.p.1. Bachelor of Science in Chemical Engineering (General Curriculum)

3.2.p.2. Bachelor of Science in Civil Engineering

3.2.p.3. Bachelor of Science in Industrial Engineering

3.2.q. The date of manuscript submission shall correspond to the month and year when the numerical grade of the student in his or her thesis/field practice/special problem is submitted by his or her adviser to the office of the college secretary. It shall be written in uppercase letters and center-aligned in the page (e.g. for first semester: DECEMBER 2015; for second semester: JUNE 2016; for mid-year: JULY 2016). It should be emphasized that even if the student submitted his or her manuscript at the start or middle of the semester, the date of manuscript submission shall still be the month and year when his or her numerical grade was submitted to the office of the college secretary, which is usually at the end of the semester/term.

3.2.r. An additional portion on the title page should indicate who can have access to the manuscript (see Pattern **3.2.s.**). The instruction should adhere to the requirements of college librarians who will also be subjected to non-disclosure agreements. The author and the adviser should decide on the access level of the manuscript and shall sign on the space provided after the instruction. Only one access level shall be answered with "YES". A dash "-" should be indicated in the other access levels.

3.2.s. Pattern and Example **3.2.s.**

This thesis/field practice/special problem[3] manuscript can be accessed:

By the general public	-
Only after consultation with the author/adviser	-
Only by those bound by confidentiality agreement	YES

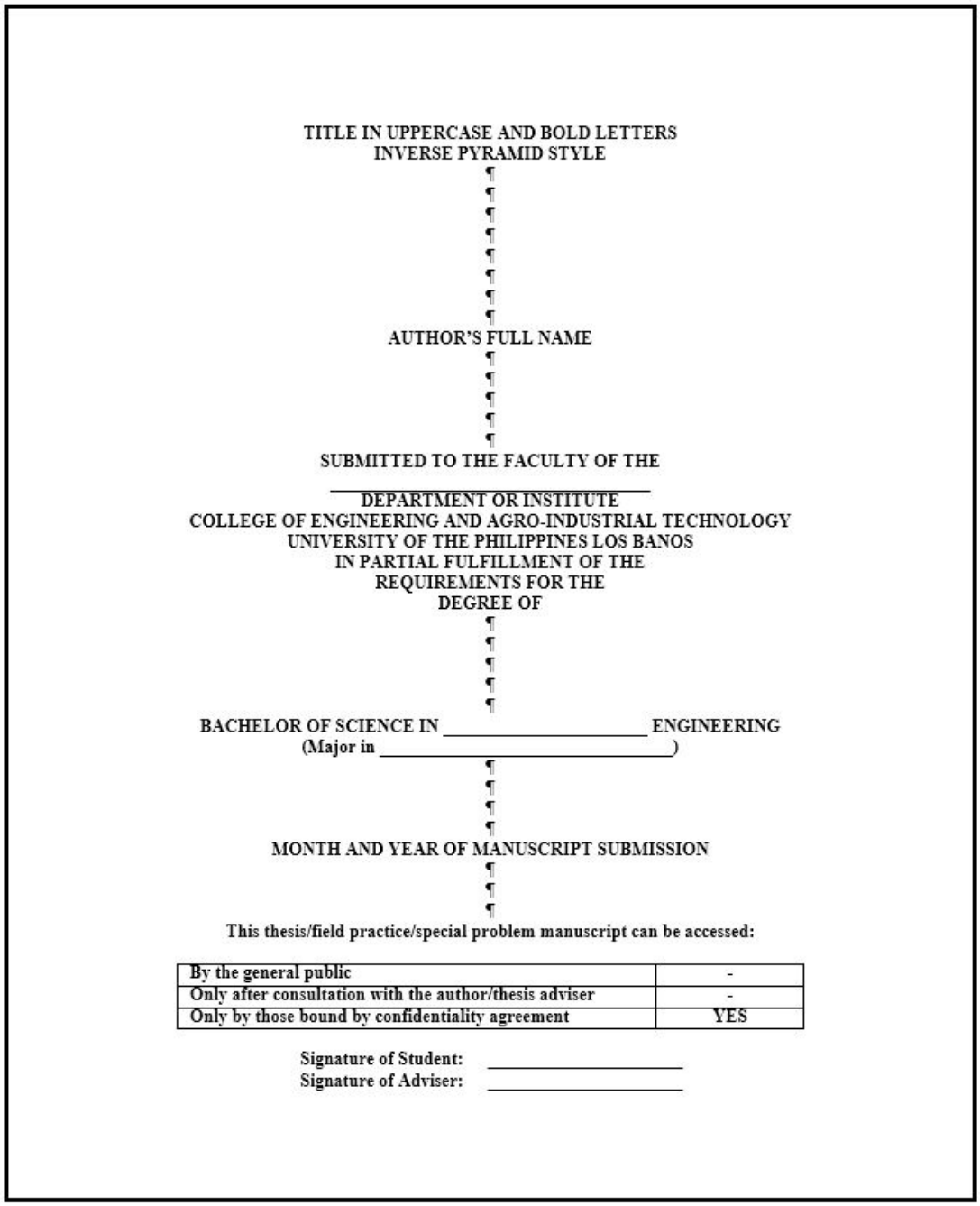
Signature of Student: _____

Signature of Adviser: _____

3.2.t. The title page shall have an imaginary page number.

[3] Choose appropriately.

3.2.u. Pattern **3.2.u.** ***Note:*** In this pattern, the number of spaces between word groups, as shown by the symbol ¶, is for illustration purposes only. The actual number of spaces will depend on length of the title and the presence/omission of the lines for divisions and majors. It should be emphasized, however, that the requirements of Sections **3.2.a.** to **3.2.t.** shall still be followed. See also Examples **3.2.v.** to **3.2.x.**



TITLE IN UPPERCASE AND BOLD LETTERS
INVERSE PYRAMID STYLE

¶ ¶ ¶ ¶ ¶ ¶ ¶

AUTHOR'S FULL NAME

¶ ¶ ¶ ¶ ¶

SUBMITTED TO THE FACULTY OF THE

_____
DEPARTMENT OR INSTITUTE
COLLEGE OF ENGINEERING AND AGRO-INDUSTRIAL TECHNOLOGY
UNIVERSITY OF THE PHILIPPINES LOS BANOS
IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE
DEGREE OF

¶ ¶ ¶ ¶ ¶

BACHELOR OF SCIENCE IN _____ ENGINEERING
(Major in _____)

¶ ¶ ¶ ¶

MONTH AND YEAR OF MANUSCRIPT SUBMISSION

¶ ¶ ¶

This thesis/field practice/special problem manuscript can be accessed:

By the general public	-
Only after consultation with the author/thesis adviser	-
Only by those bound by confidentiality agreement	YES

Signature of Student: _____
Signature of Adviser: _____

3.2.v. Example **3.2.v.**: Title page for BSABE

DESIGN, EVALUATION AND OPTIMIZATION OF A PROTOTYPE UPDRAFT GASIFIER STOVE USING POULTRY LITTER AS FUEL

DAVID LEGASTO BONDOC

SUBMITTED TO THE FACULTY OF THE AGRICULTURAL MACHINERY DIVISION INSTITUTE OF AGRICULTURAL ENGINEERING COLLEGE OF ENGINEERING AND AGRO-INDUSTRIAL TECHNOLOGY UNIVERSITY OF THE PHILIPPINES LOS BAÑOS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

BACHELOR OF SCIENCE IN AGRICULTURAL AND BIOSYSTEMS ENGINEERING (Major in Agricultural Machinery and Power Engineering)

JUNE 2017

This thesis manuscript can be accessed:

By the general public	**YES**
Only after consultation with the author/thesis adviser	-
Only by those bound by confidentiality agreement	-

Signature of Student: _____
Signature of Adviser: _____

3.2.w. Example **3.2.w.**: Title page for non-BSABE with Major

ASSESSMENT OF THE PERFORMANCE OF ELECTRIC MOTOR-DRIVEN PUMPING SYSTEM OF SAN PABLO CITY WATER DISTRICT (SPCWD), LAGUNA, PHILIPPINES USING PUMPING SYSTEM ASSESSMENT TOOL (PSAT)

ALDWIN GARCIA MAGHIRANG

SUBMITTED TO THE FACULTY OF THE DEPARTMENT OF ELECTRICAL ENGINEERING COLLEGE OF ENGINEERING AND AGRO-INDUSTRIAL TECHNOLOGY UNIVERSITY OF THE PHILIPPINES LOS BAÑOS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING
(Major in Power Engineering)

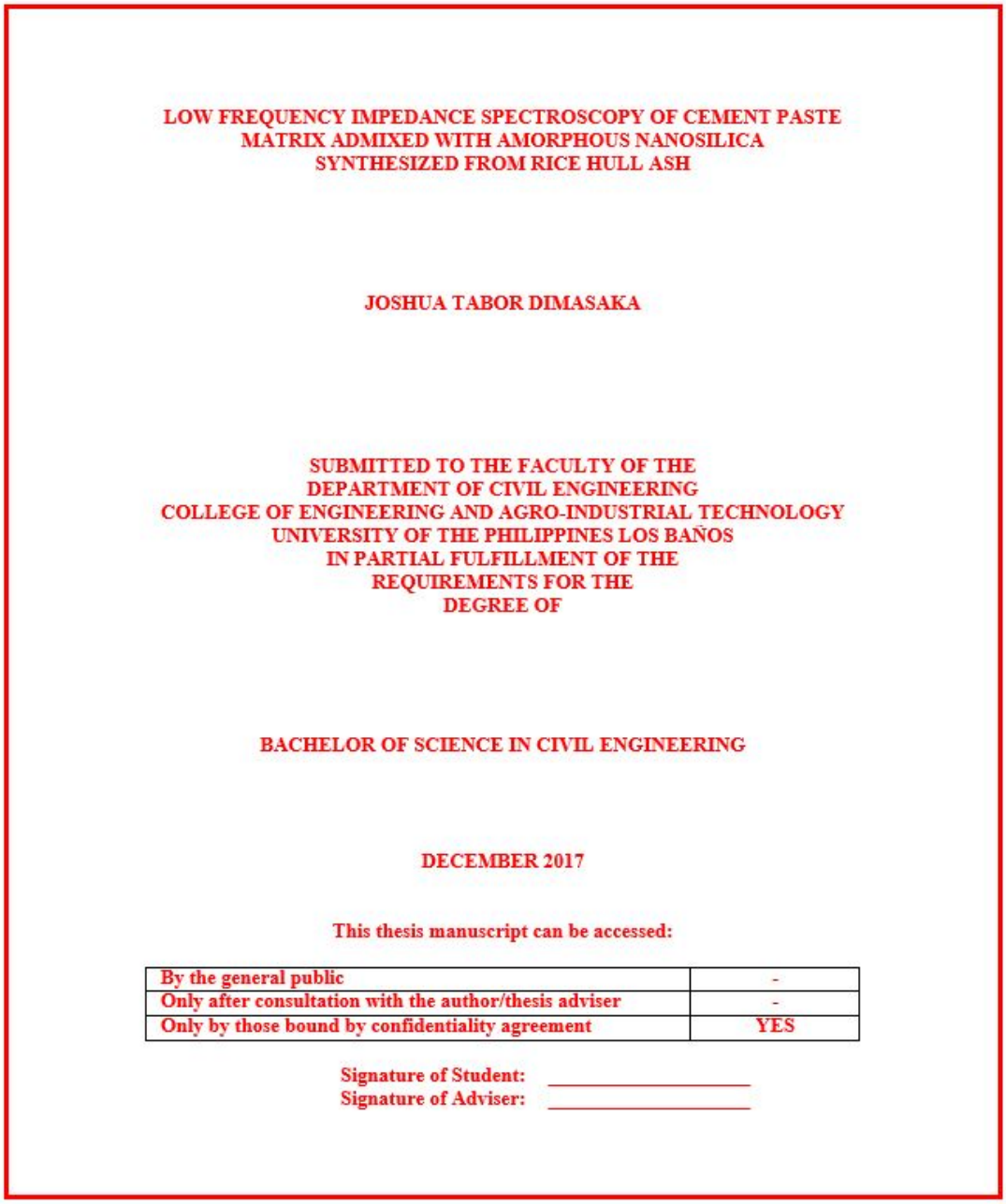
DECEMBER 2018

This field practice manuscript can be accessed:

By the general public	-
Only after consultation with the author/thesis adviser	YES
Only by those bound by confidentiality agreement	-

Signature of Student: _____
Signature of Adviser: _____

3.2.x. Example **3.2.x.**: Title page for non-BSABE without Major



LOW FREQUENCY IMPEDANCE SPECTROSCOPY OF CEMENT PASTE MATRIX ADMIXED WITH AMORPHOUS NANOSILICA SYNTHESIZED FROM RICE HULL ASH

JOSHUA TABOR DIMASAKA

SUBMITTED TO THE FACULTY OF THE
DEPARTMENT OF CIVIL ENGINEERING
COLLEGE OF ENGINEERING AND AGRO-INDUSTRIAL TECHNOLOGY
UNIVERSITY OF THE PHILIPPINES LOS BAÑOS
IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE
DEGREE OF

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

DECEMBER 2017

This thesis manuscript can be accessed:

By the general public	-
Only after consultation with the author/thesis adviser	-
Only by those bound by confidentiality agreement	YES

Signature of Student: _____
Signature of Adviser: _____

Section 3.3. Approval Page

3.3.a. The title “APPROVAL PAGE” shall not appear anywhere in the page.

3.3.b. The approval page shall be introduced by a paragraph stating that the manuscript is accepted by a hierarchy of signatories. The said paragraph shall contain the following information, presented in uppercase and bold letters:

3.3.b.1. Full thesis, field practice or special problem title

3.3.b.2. Full name of the author

3.3.b.3. Degree

3.3.c. The first line of the introductory paragraph shall be indented $1/2$ inch to the right. The paragraph shall be in double space and shall be written according to the format illustrated in Pattern **3.3.d.** See also Examples **3.3.e.** to **3.3.g.**

3.3.d. Pattern **3.3.d.**

The (thesis/field practice report/special problem report) attached hereto, entitled "**THESIS, FIELD PRACTICE OR SPECIAL PROBLEM TITLE**" prepared and submitted by **AUTHOR'S FULL NAME** in partial fulfillment of the requirements for the degree of **DEGREE**, is hereby accepted.

3.3.e. Example **3.3.e.**

The thesis attached hereto, entitled "**LOW FREQUENCY IMPEDANCE SPECTROSCOPY OF CEMENT PASTE MATRIX ADMIXED WITH AMORPHOUS NANOSILICA SYNTHESIZED FROM RICE HULL ASH**" prepared and submitted by **JOSHUA TABOR DIMASAKA** in partial fulfillment of the requirements for the degree of **BACHELOR OF SCIENCE IN CIVIL ENGINEERING**, is hereby accepted.

3.3.f. Example **3.3.f.**

The field practice report attached hereto, entitled "**A FIELD PRACTICE REPORT ON THE EVALUATION OF RICE MILLING OPERATIONS AND MANAGEMENT AT RICE MILL AREA, SL AGRITECH CORPORATION TALAVERA, NUEVA ECIJA, PHILIPPINES**" prepared and submitted by **JOHN CARLO LLAMOSO NAVASERO** in partial fulfillment of the requirements for the degree of **BACHELOR OF SCIENCE IN AGRICULTURAL AND BIOSYSTEMS ENGINEERING**, is hereby accepted.

3.3.g. Example **3.3.g.**

The special problem report attached hereto, entitled "**ANTHROPOMETRIC EVALUATION OF THE DESIGN OF SCHOOL FURNITURE FOR STUDENTS AGED 6 TO 9 IN SORSOGON CITY, SORSOGON, PHILIPPINES**" prepared and submitted by **DONA KATRINA DOLOSA ENOLVA** in partial fulfillment of the requirements for the degree of **BACHELOR OF SCIENCE IN INDUSTRIAL ENGINEERING**, is hereby accepted.

3.3.h. The format and layout for the space where the signatories shall sign are illustrated in Pattern **3.3.i.**

3.3.i. Pattern **3.3.i.**

FULL NAME OF SIGNATORY
Designation
Guidance Committee or Office

Date Signed

3.3.j. The name of the signatory shall be written in full (with middle initial) and in uppercase and bold letters. For consistency, titles like “Prof.”, “Engr.”, “Dr.”, “Mr.”, “Ph.D.”, etc, shall not be included in the signatory’s name.

3.3.k. For consistency, the following terms shall be used to indicate the designation of the signatory:

3.3.k.1.	Member	for panel members
3.3.k.2.	Adviser and Chair	for advisers and guidance committee chairs
3.3.k.3.	Co-Adviser	for co-advisers
3.3.k.4.	Chair	for division chairs and department chairs
3.3.k.5.	Director	for institute directors
3.3.k.6.	Dean	for the college dean

3.3.l. The line above the name of the signatory shall be kept similar in length for all the signatories. If possible, the length of the said line should be equal to the length of the name of the signatory with the longest name. The name and designation of the signatory shall be center-aligned relative to this line.

3.3.m. To illustrate the format prescribed by the preceding paragraphs, Examples **3.3.n.** to **3.3.s.** should be considered.

3.3.n. Example **3.3.n.**: Panel Member

STEPHEN S. DOLIENTE
Member
Guidance Committee

Date Signed

3.3.o. Example **3.3.o.**: Adviser

RICHELLE G. ZAFRA
Adviser and Chair
Guidance Committee

Date Signed

3.3.p. Example **3.3.p.**: Division Chair

MARION LUX Y. CASTRO
Chair
Agrometeorology and Farm Structures Division

Date Signed

3.3.q. Example **3.3.q.**: Department Chair

KAREN-CHRISTIAN C. AGNO
Chair
Department of Electrical Engineering

Date Signed

3.3.r. Example **3.3.r.**: Institute Director

FERNANDO O. PARAS, Jr.
Director
Institute of Agricultural Engineering

Date Signed

3.3.s. Example **3.3.s.**: College Dean

ARNOLD R. ELEPAÑO
Dean
College of Engineering and Agro-Industrial Technology

Date Signed

3.3.t. The names of the signatories shall be arranged and laid out in the page according to the format illustrated in Patterns **3.3.u.** to **3.3.x.** In rare instances when the name of the signatories are too long to be laid-out opposite to each other, the author is granted flexibility to introduce modifications to the approval page (e.g. reduce the font size to 11, slightly decrease the margins, etc.), provided that the lay-out is still maintained.

3.3.u. Pattern **3.3.u.**: 3-Member Panel – BSABE

The (thesis, field practice or special problem report) attached hereto, entitled "**THESIS, FIELD PRACTICE OR SPECIAL PROBLEM TITLE**" prepared and submitted by **AUTHOR'S FULL NAME**" in partial fulfillment of the requirements for the degree of **DEGREE** is hereby accepted.

¶
¶

FULL NAME OF SIGNATORY
Member
Guidance Committee

Date Signed

FULL NAME OF SIGNATORY
Member
Guidance Committee

Date Signed

FULL NAME OF SIGNATORY
Adviser and Chair
Guidance Committee

Date Signed

FULL NAME OF SIGNATORY
Chair
Academic Division

Date Signed

FULL NAME OF SIGNATORY
Director
Institute of Agricultural Engineering

Date Signed

FULL NAME OF SIGNATORY
Dean
College of Engineering and Agro-Industrial Technology

Date Signed

3.3.v. Pattern **3.3.v.**: 3-Member Panel – non-BSABE

The (thesis, field practice or special problem report) attached hereto, entitled "**THESIS, FIELD PRACTICE OR SPECIAL PROBLEM TITLE**" prepared and submitted by **AUTHOR'S FULL NAME**" in partial fulfillment of the requirements for the degree of **DEGREE** is hereby accepted.

¶
¶

FULL NAME OF SIGNATORY
Member
Guidance Committee

Date Signed

FULL NAME OF SIGNATORY
Member
Guidance Committee

Date Signed

FULL NAME OF SIGNATORY
Adviser and Chair
Guidance Committee

Date Signed

FULL NAME OF SIGNATORY
Chair
Department

Date Signed

FULL NAME OF SIGNATORY
Dean
College of Engineering and Agro-Industrial Technology

Date Signed

3.3.w. Pattern **3.3.w.**: 4-Member Panel – BSABE

The (thesis, field practice or special problem report) attached hereto, entitled "**THESIS, FIELD PRACTICE OR SPECIAL PROBLEM TITLE**" prepared and submitted by **AUTHOR'S FULL NAME**" in partial fulfillment of the requirements for the degree of **DEGREE** is hereby accepted.

¶
¶

FULL NAME OF SIGNATORY
Member
Guidance Committee

Date Signed

FULL NAME OF SIGNATORY
Member
Guidance Committee

Date Signed

FULL NAME OF SIGNATORY
Member
Guidance Committee

Date Signed

FULL NAME OF SIGNATORY
Adviser and Chair
Guidance Committee

Date Signed

FULL NAME OF SIGNATORY
Chair
Academic Division

Date Signed

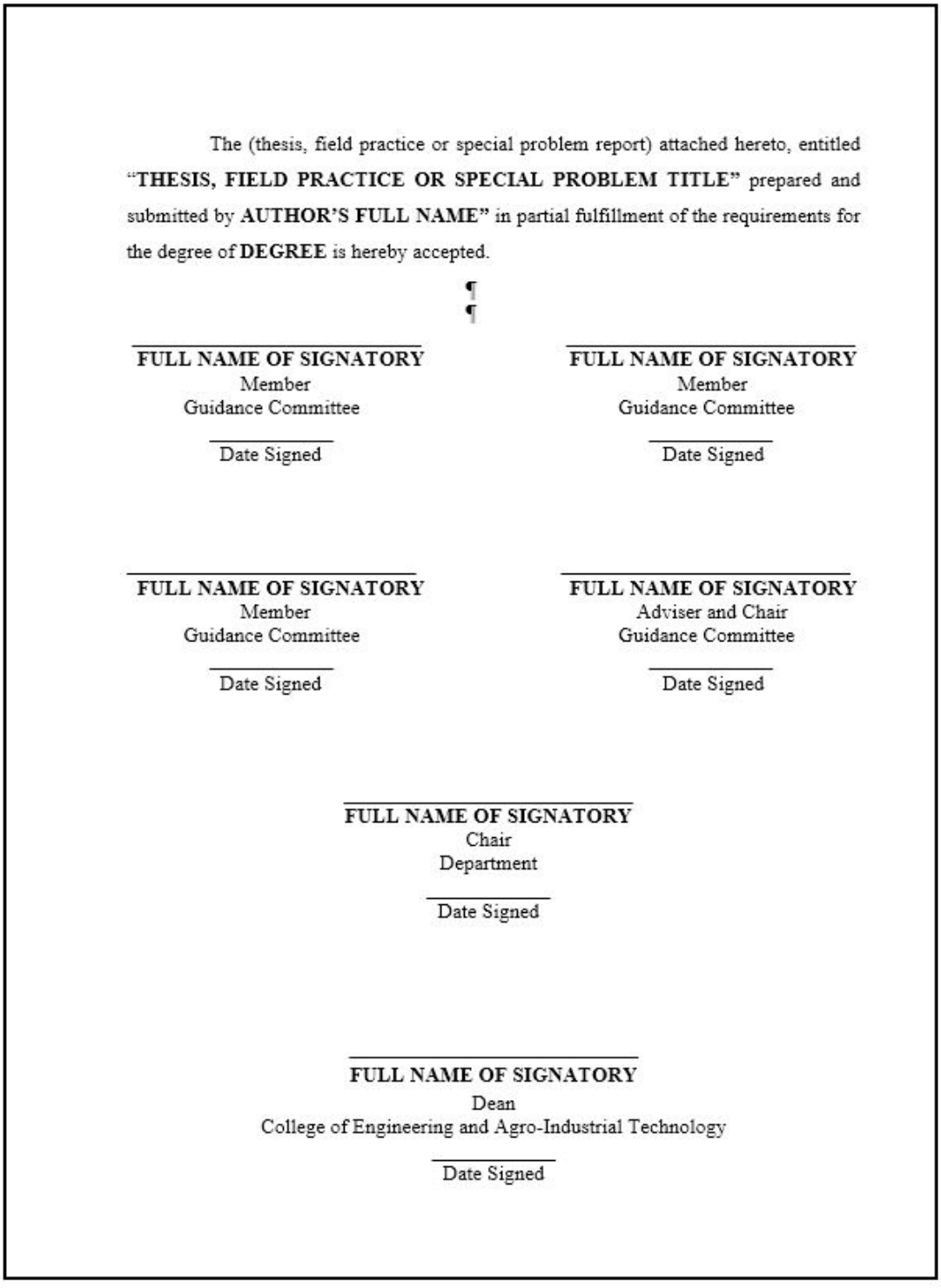
FULL NAME OF SIGNATORY
Director
Institute of Agricultural Engineering

Date Signed

FULL NAME OF SIGNATORY
Dean
College of Engineering and Agro-Industrial Technology

Date Signed

3.3.x. Pattern **3.3.x.**: 4-Member Panel – non-BSABE



The (thesis, field practice or special problem report) attached hereto, entitled "**THESIS, FIELD PRACTICE OR SPECIAL PROBLEM TITLE**" prepared and submitted by **AUTHOR'S FULL NAME**" in partial fulfillment of the requirements for the degree of **DEGREE** is hereby accepted.

¶
¶

FULL NAME OF SIGNATORY
Member
Guidance Committee

Date Signed

FULL NAME OF SIGNATORY
Member
Guidance Committee

Date Signed

FULL NAME OF SIGNATORY
Member
Guidance Committee

Date Signed

FULL NAME OF SIGNATORY
Adviser and Chair
Guidance Committee

Date Signed

FULL NAME OF SIGNATORY
Chair
Department

Date Signed

FULL NAME OF SIGNATORY
Dean
College of Engineering and Agro-Industrial Technology

Date Signed

3.3.y. The approval page shall have an imaginary page number.

Section 3.4. Biographical Sketch

3.4.a. The title "BIOGRAPHICAL SKETCH" shall be positioned at the topmost line of the page, center aligned and in uppercase and bold letters.

3.4.b. Three (3) spaces shall be maintained between the title and the first line of the first paragraph. The lines shall be double spaced and no spacing between paragraphs.

3.4.c. The biographical sketch shall be limited to one (1) page only.

3.4.d. Preferably, the biographical sketch should be in English and written in the third person point of view.

3.4.e. A colored, half-body studio photo of the author, wearing corporate attire (e.g. for male: coat and tie; for female: blouse and blazer) with white background, should be included in the biographical sketch. The photo shall be bordered by black lines on all sides, be 3-inch high and 2-inch wide and shall be text-wrapped at the upper right portion of the first paragraph of the biographical sketch (see Pattern **3.4.g.**).

3.4.f. The full name of the author, in uppercase letters, shall appear four (4) spaces below the last line of the last paragraph. Such name shall be flushed to the right margin. The author shall sign above his or her name attesting to the accuracy of the information included in the biographical sketch.

3.4.g. Pattern and Example **3.4.g.**

BIOGRAPHICAL SKETCH

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College of Engineering and Agro-Industrial
of Agricultural and Biosystems Engineering. De
Engineering. Department of Civil Engineering. De
Engineering. Department of Industrial Engine
Engineering Science. College of Engineering
Technology.

College of Engineering and Agro-Industrial
of Agricultural and Biosystems Engineering. De
Engineering. Department of Civil Engineering. D
Engineering. Department of Industrial Engineering. Department of Engineering Science. College of Engineering and Agro-Industrial Technology. Institute of Agricultural and Biosystems Engineering. Department of Chemical Engineering. Department of Civil Engineering. Department of Electrical Engineering. Department of Industrial Engineering. Department of Engineering Science.

College of Engineering and Agro-Industrial Technology. Institute of Agricultural and Biosystems Engineering. Department of Chemical Engineering. Department of Civil Engineering. Department of Electrical Engineering. Department of Industrial Engineering. Department of Engineering Science.

¶
¶

Signature ¶

AUTHOR'S FULL NAME

page

Section 3.5. Acknowledgment

3.5.a. The title “ACKNOWLEDGMENT” shall be positioned at the topmost line of the page, center aligned and in uppercase and bold letters.

3.5.b. Three (3) spaces shall be maintained between the title and the first line of the first paragraph.

3.5.c. There is no prescribed line spacing for this section but the font size and page alignment (justified) shall be maintained.

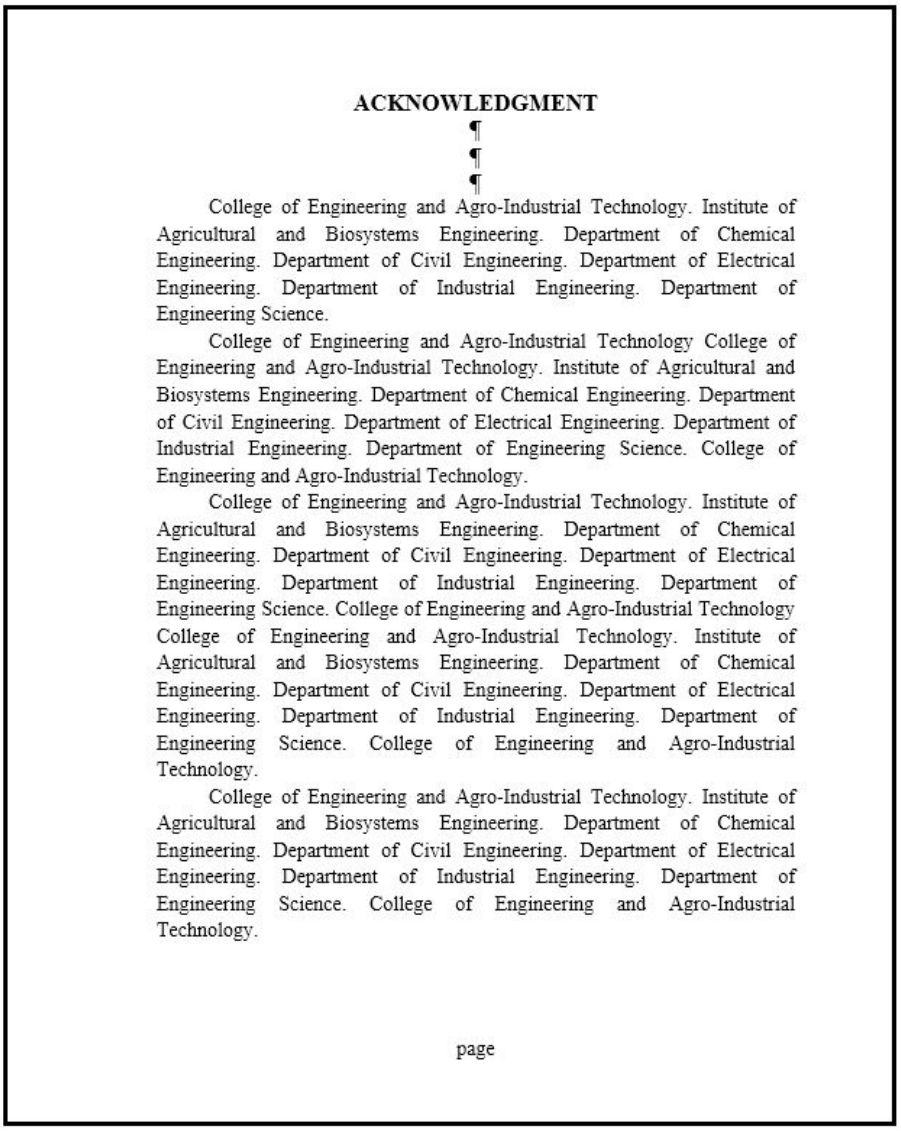
3.5.d. The acknowledgment shall be limited to five (5) pages only.

3.5.e. Preferably, the acknowledgment should be in pure English. However, Filipino words may be used provided that they will be italicized or enclosed in quotations marks as they appear in the text. If possible, bold and underlined words or phrases shall not appear in the body of the acknowledgment.

3.5.f. The acknowledgment may be written in first or third person point of view.

3.5.g. Pictures or figures of any kind are prohibited in the acknowledgment. Likewise, inappropriate colloquial words are not permitted.

3.5.h. Pattern **3.5.h.**



ACKNOWLEDGMENT

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¶

College of Engineering and Agro-Industrial Technology. Institute of Agricultural and Biosystems Engineering. Department of Chemical Engineering. Department of Civil Engineering. Department of Electrical Engineering. Department of Industrial Engineering. Department of Engineering Science.

College of Engineering and Agro-Industrial Technology College of Engineering and Agro-Industrial Technology. Institute of Agricultural and Biosystems Engineering. Department of Chemical Engineering. Department of Civil Engineering. Department of Electrical Engineering. Department of Industrial Engineering. Department of Engineering Science. College of Engineering and Agro-Industrial Technology.

College of Engineering and Agro-Industrial Technology. Institute of Agricultural and Biosystems Engineering. Department of Chemical Engineering. Department of Civil Engineering. Department of Electrical Engineering. Department of Industrial Engineering. Department of Engineering Science. College of Engineering and Agro-Industrial Technology. College of Engineering and Agro-Industrial Technology. Institute of Agricultural and Biosystems Engineering. Department of Chemical Engineering. Department of Civil Engineering. Department of Electrical Engineering. Department of Industrial Engineering. Department of Engineering Science. College of Engineering and Agro-Industrial Technology.

College of Engineering and Agro-Industrial Technology. Institute of Agricultural and Biosystems Engineering. Department of Chemical Engineering. Department of Civil Engineering. Department of Electrical Engineering. Department of Industrial Engineering. Department of Engineering Science. College of Engineering and Agro-Industrial Technology.

page

Section 3.6. Table of Contents

3.6.a. The title “TABLE OF CONTENTS” shall be positioned at the topmost line of the page, center aligned and in uppercase and bold letters.

3.6.b. Two (2) columns shall be created where the items and their corresponding page numbers are listed. The first column shall contain the list of the items to be included and such column shall not contain any heading. All the contents of the first column shall be flushed to the left margin.

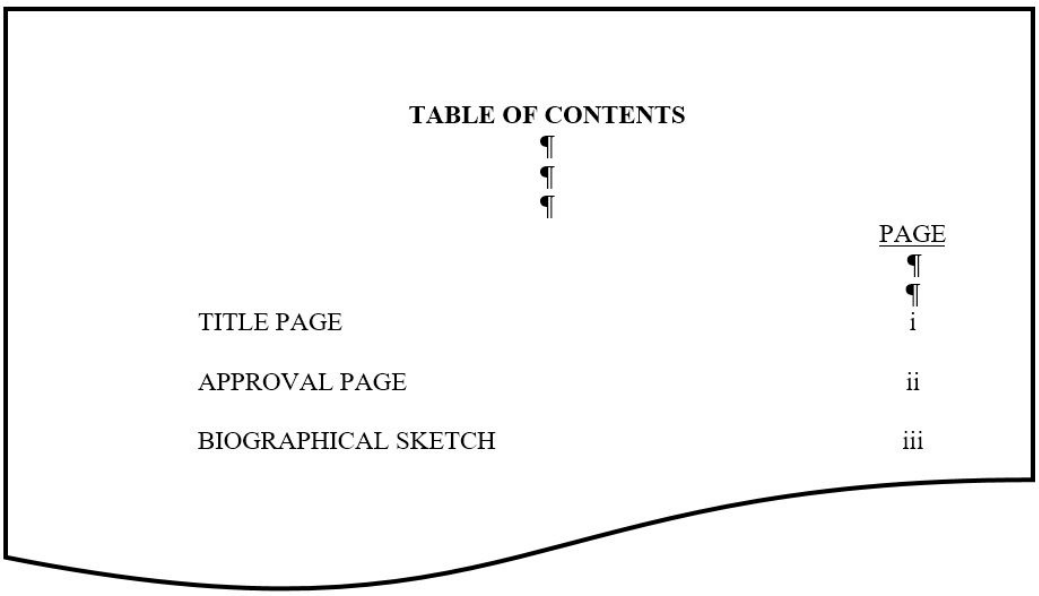
3.6.c. The second column shall contain the heading “PAGE”, underlined and in uppercase letters. This heading shall be four (4) spaces below the line containing the title “TABLE OF CONTENTS.”

3.6.d. The first item in the list (e.g. TITLE PAGE) shall be three (3) spaces below the line containing the heading “PAGE”.

3.6.e. Dots or dashes connecting the items to their corresponding page numbers shall be omitted.

3.6.f. Page numbers shall be listed under and “centered” relative to the heading “PAGE” (see Example **3.6.g.**).

3.6.g. Example **3.6.g.**

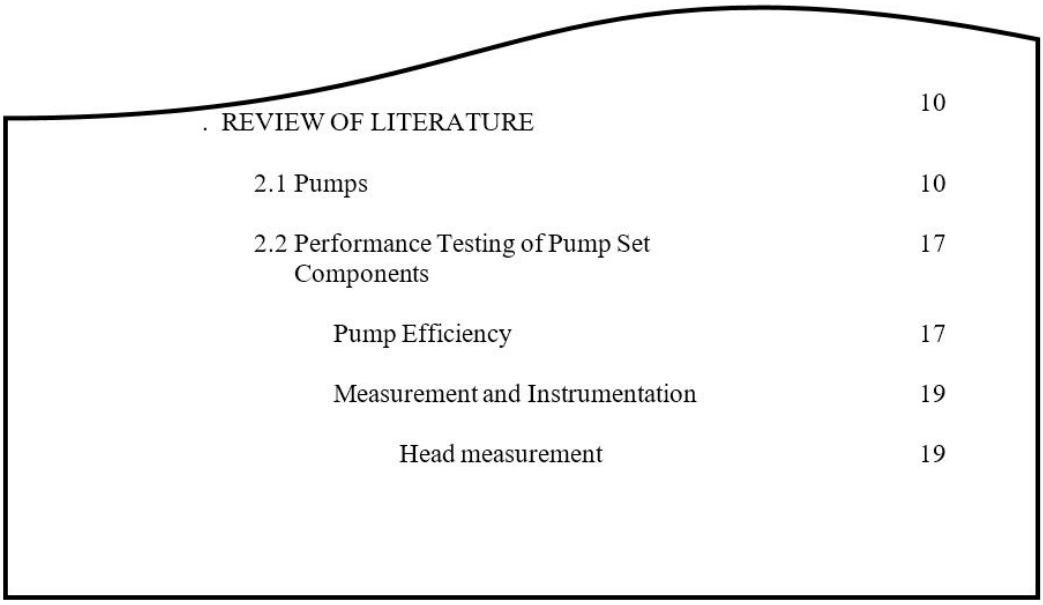


3.6.h. Double spaces shall be maintained between entries but single space should be maintained within entries.

3.6.i. The headings and sections to be listed in the table of contents shall have the same case formatting as what is found and prescribed in the text.

3.6.j. Major subsections shall be indented 1/2 inch to the right reckoned from the main heading. Likewise, minor subsections shall be indented 1/2 inch to the right relative to the major subsection. Paragraph headings shall be indented 1/2 inch to the right relative to the minor subsection.

3.6.k. Example **3.6.k.**



. REVIEW OF LITERATURE 10

2.1 Pumps 10

2.2 Performance Testing of Pump Set Components 17

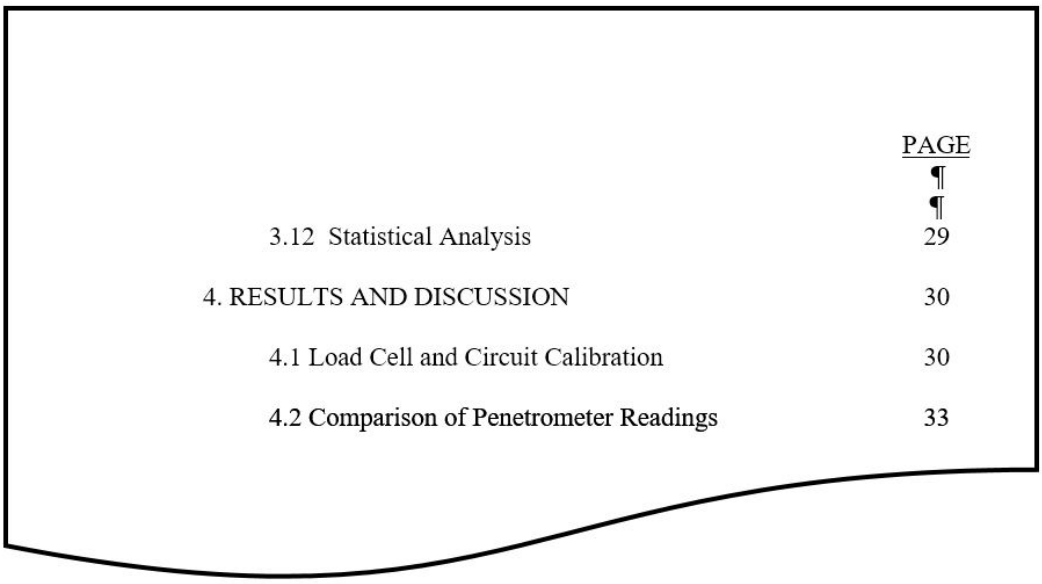
Pump Efficiency 17

Measurement and Instrumentation 19

Head measurement 19

3.6.l. Usually, the “TABLE OF CONTENTS” exceeds one page, and in such a case, the list shall be continued in succeeding pages and the line containing the heading “PAGE” shall still appear in each page.

3.6.m. Example **3.6.m.**



PAGE

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3.12 Statistical Analysis 29

4. RESULTS AND DISCUSSION 30

4.1 Load Cell and Circuit Calibration 30

4.2 Comparison of Penetrometer Readings 33

3.6.n. Only the title “TABLE OF CONTENTS” shall be bold and the remaining entries and page numbers shall be in their regular formatting.

Section 3.7. List of Tables, Figures, Appendices, Appendix Tables and Appendix Figures

3.7.a. Tables and figures presented in the main text shall appear in the “LIST OF TABLES” and “LIST OF FIGURES”, respectively.

3.7.b. Tables and figures considered to be part of the appendices shall be listed in the "LIST OF APPENDIX TABLES" and "LIST OF APPENDIX FIGURES", respectively. Likewise, all appendices shall be listed under the "LIST OF APPENDICES."

3.7.c. The five lists enumerated in the preceding paragraphs have similar formats which are stated in subsequent paragraphs.

3.7.d. The title of the list (e.g. "LIST OF TABLES") shall be positioned at the topmost line of the page, center aligned and in uppercase and bold letters.

3.7.e. Three columns shall be created where the items and their corresponding page numbers are listed. The first column shall contain the number (for tables and figures) or letter (for appendices) of the items to be included. This column shall contain the appropriate heading ("TABLE", "FIGURE", "APPENDIX", "APPENDIX TABLE", "APPENDIX FIGURE"), underscored and in uppercase letters.

3.7.f. The second column shall contain the list of the items to be included and such column shall not contain any heading. All the contents of the second column shall be flushed to the left margin of that column.

3.7.g. The third column shall contain the heading "PAGE", underscored and in uppercase letters. The headings shall be four (4) spaces below the line containing the title of the list.

3.7.h. The first item in the list shall be three (3) spaces below the line containing the column headings (see Example **3.7.i.**)

3.7.i. Example **3.7.i.**

LIST OF TABLES

¶
¶
¶

TABLE		PAGE
		¶
		¶
1-1	Visual description of the three sampling sites	30
1-2	Analysis of variance table	40
2-3	Water quality analysis of the three sampling sites	46

3.7.j. The first item in the list shall be three (3) spaces below the line containing the column headings.

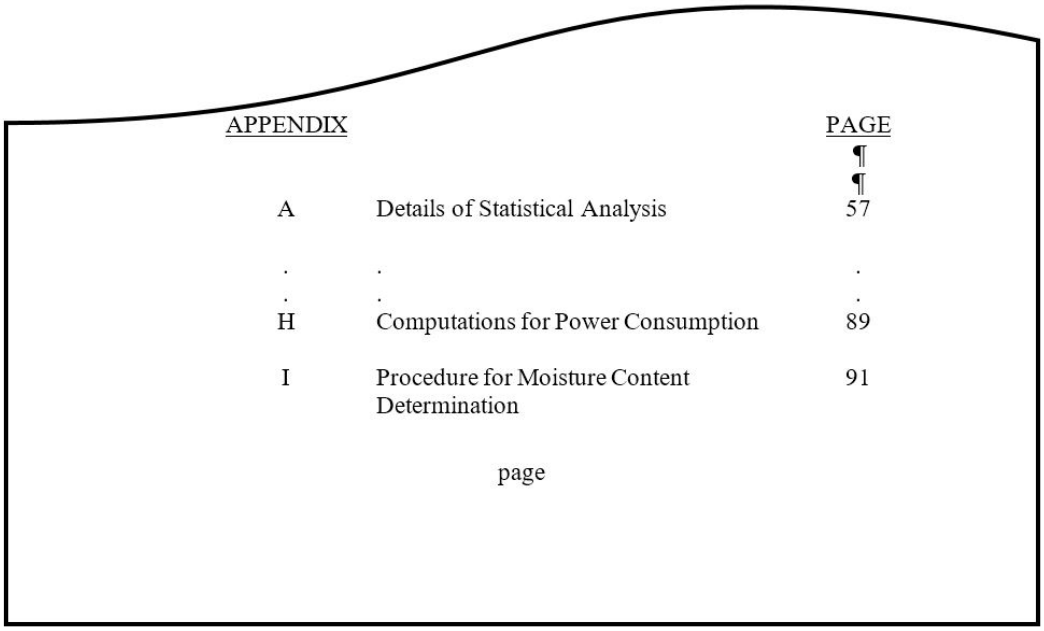
3.7.k. Table or figure numbers or appendix letters shall be listed under and "centered" relative to their respective headings. Likewise, page numbers shall be listed under and "centered" relative to the heading "PAGE".

3.7.l. Double spaces shall be maintained between entries but single space should be maintained within entries.

3.7.m. In cases where the items or titles are too long, they shall be cut in such a way that the top line is always longer than the succeeding lines.

3.7.n. The headings and sections to be listed in the list shall have the same case formatting as what is found and prescribed in the text (see Example **3.7.o.**)

3.7.o. Example **3.7.o.**

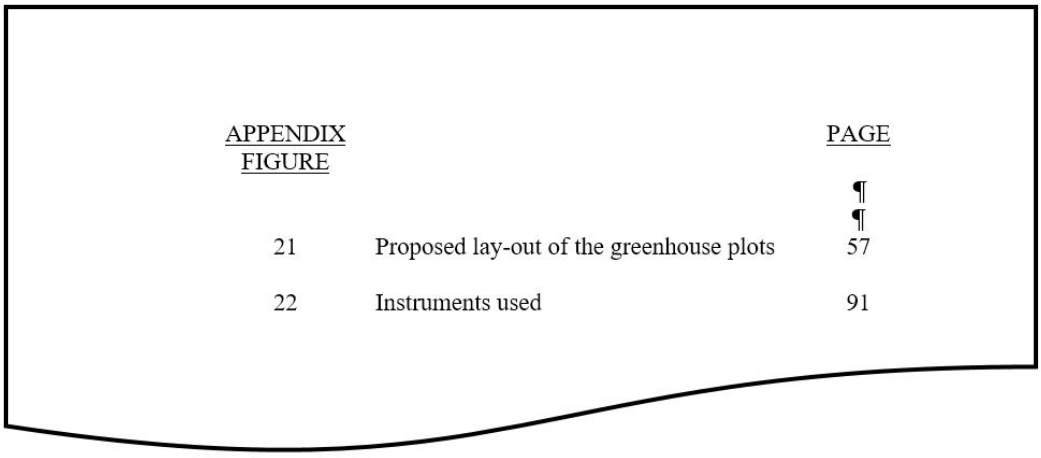


APPENDIX		PAGE
		¶
		¶
A	Details of Statistical Analysis	57
.	.	.
.	.	.
H	Computations for Power Consumption	89
I	Procedure for Moisture Content Determination	91

page

3.7.p. In cases where the list exceeds one page, it shall be continued in succeeding pages and the line containing the column headings shall still appear in each page (see Example **3.7.q.**)

3.7.q. Example **3.7.q.**



APPENDIX FIGURE		PAGE
		¶
		¶
21	Proposed lay-out of the greenhouse plots	57
22	Instruments used	91

3.7.r. Only the list titles shall be bold and the remaining entries and page numbers shall be in their regular formatting.

Section 3.8. Acronyms and Abbreviations

3.8.a. This preliminary section shall be created only if the combined number of acronyms and abbreviations to be included in the list is at least five (5). If the number is below five, it is recommended that the items are defined instead in the body of the main text, specifically in the sections where they were first introduced/mentioned.

3.8.b. Symbols used to represent variables and constants in equations shall not be included in the list of acronyms and abbreviations. Variables and constants are defined according to the format prescribed in Section 7.2.

3.8.c. There shall only be one list of acronyms and abbreviations, i.e. they shall not be segregated into 'Acronyms' or 'Abbreviations'. The items shall be listed alphabetically, regardless if the item starts with an uppercase letter or a lowercase letter.

3.8.d. The title "ACRONYMS AND ABBREVIATIONS" shall be positioned at the topmost line of the page, center aligned and in uppercase and bold letters.

3.8.e. Two (2) columns shall be created where the acronyms/abbreviations and their corresponding meanings are listed.

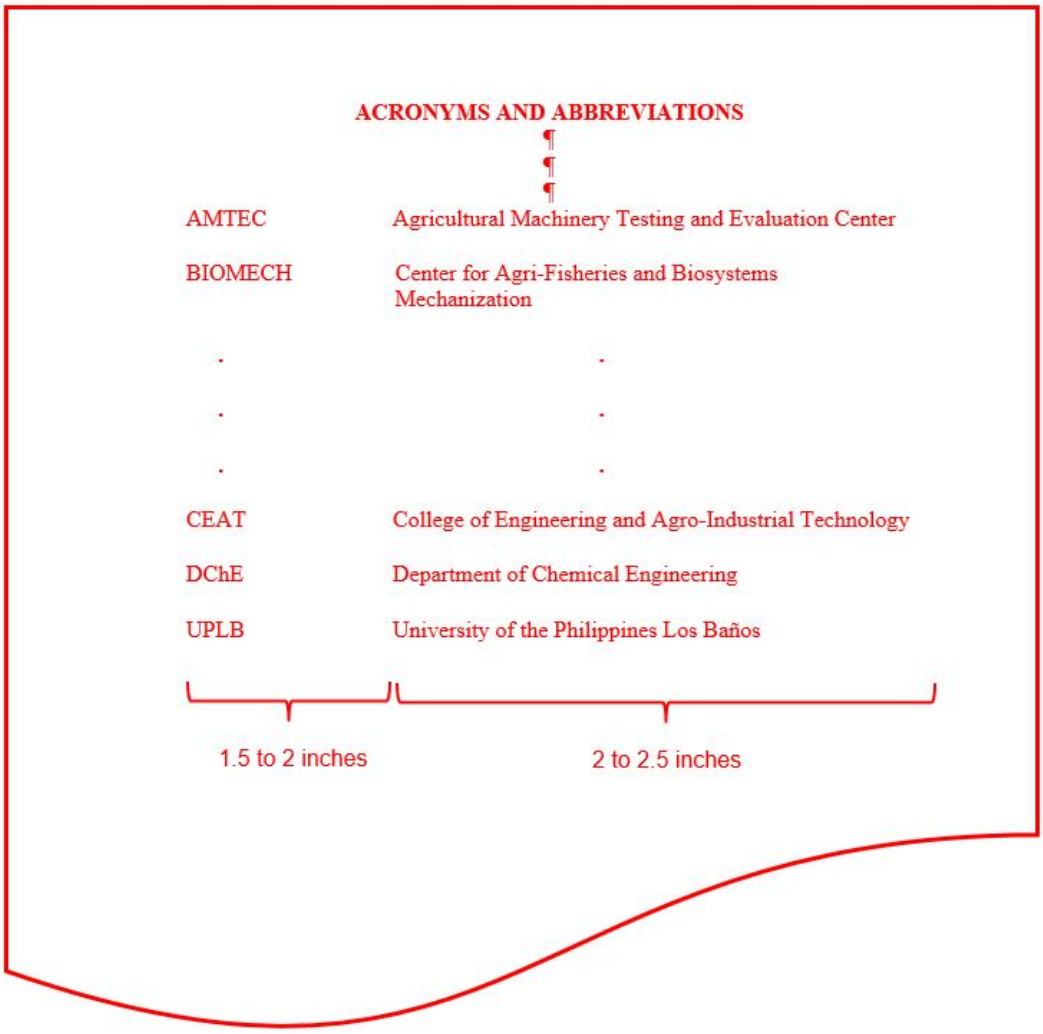
3.8.f. The first column shall contain the alphabetical list of acronyms and abbreviations. When reckoned from the left margin of the page, the width of the first column should be around 1.5 inches to 2 inches.

3.8.g. The second column shall contain the corresponding meanings of the acronyms/abbreviations. When reckoned from the right edge of the first column, the width of the second column should be around 2 inches to 2.5 inches.

3.8.h. The first entry in the list shall start four (4) spaces below the title "ACRONYMS AND ABBREVIATIONS". All entries should be flushed to the left side of the column. Double spaces shall be maintained between entries but single space should be maintained within entries.

3.8.i. Only the title shall be bold and the other entries shall be in their regular formatting.

3.8.j. Example **3.8.j.**



Section 3.9. Abstract or Executive Summary

3.9.a. The title “ABSTRACT” or “EXECUTIVE SUMMARY” shall be positioned at the topmost line of the page, center aligned and in uppercase and bold letters.

3.9.b. The abstract or executive summary shall be introduced by a paragraph describing the publishing details of the manuscript. Such paragraph shall contain the following information, with their corresponding formatting:

3.9.b.1. Author’s full name (surname first, followed by first name and middle name; in uppercase and bold)

3.9.b.2. College

3.9.b.3. University

3.9.b.4. Month and year of manuscript submission

3.9.b.5. Full title of thesis, field practice or special problem (in title case and bold with complete meaning of acronyms written on the FRONT COVER followed by the acronym written inside an open and close parenthesis)

3.9.c. The items enumerated in Section **3.9.b.** shall appear according to their order in the list. Furthermore, they shall be separated by period, followed by a space.

3.9.d. The first line of the introductory paragraph shall be flushed to the left margin of the page and positioned four (4) spaces below the title “ABSTRACT” or “EXECUTIVE SUMMARY”. The paragraph shall be in single space and shall be written according to the format illustrated in Pattern **3.9.e.** and Example **3.9.f.**

3.9.e. Pattern **3.9.e.**

> **AUTHOR’S NAME (LAST, FIRST MIDDLE)**. College of Engineering and Agro-Industrial Technology, University of the Philippines Los Baños. Month and Year of Manuscript Submission. **Title of Thesis, Field Practice or Special Problem Manuscript.**

3.9.f. Example **3.9.f.**

> **BALDOZ, MARK ANTHONY MABILANGAN.** College of Engineering and Agro-Industrial Technology, University of the Philippines Los Baños. April 2009. **Multiple Job Scheduling of the Nine New Products of KZ Step1 Model at the Metal Fabrication Division of Roberts Automotive and Industrial Manufacturing Corporation, Cabuyao, Laguna, Philippines.**

3.9.g. The name of the major adviser (first, middle initial, last), in title case and flushed in the left margin of the page, shall be indicated three (3) spaces below the introductory paragraph. Titles like “Prof.”, “Engr.”, “Dr.” shall be included in the adviser’s full name. The name shall be introduced by the phrase “Major Adviser:”.

3.9.h. In the case of a ’co-advised’ work, the name of the co-adviser shall be formatted similar to the format of the major adviser’s name (prescribed in Section **3.9.g.**). However, the co-adviser’s name shall be introduced by the phrase “Co-Adviser:” and is positioned below the name of the major adviser (see Pattern **3.9.l.**).

3.9.i. For the thesis, the abstract shall not be more than 250 words and shall be written in third person point of view.

3.9.j. For the Field Practice and Special Problem, the executive summary shall not be more than 350 words and shall be written in third person point of view.

3.9.k. The abstract or executive summary shall be double-spaced and limited to one paragraph only. The first line of the paragraph shall be indented $1/2$ inch to the right and shall start three (3) spaces below the line containing the name of the major adviser or co-adviser (if any).

3.9.I. Pattern **3.9.I.**

ABSTRACT

¶
¶
¶

AUTHOR'S NAME (LAST, FIRST MIDDLE). College of Engineering and Agro-Industrial Technology, University of the Philippines Los Baños. Month and Year of Manuscript Submission. **Title of Thesis, Field Practice or Special Problem Manuscript.**

¶
¶

Major Adviser: Prof. _____

Co-Adviser: Engr. _____

¶
¶

College of Engineering and Agro-Industrial Technology. Institute of Agricultural and Biosystems Engineering. Department of Chemical Engineering. Department of Civil Engineering. Department of Electrical Engineering. Department of Industrial Engineering. Department of Engineering Science. College of Engineering and Agro-Industrial Technology. Institute of Agricultural and Biosystems Engineering. Department of Chemical Engineering. Department of Civil Engineering. Department of Electrical Engineering. Department of Industrial Engineering. Department of Engineering Science. College of Engineering and Agro-Industrial Technology. Institute of Agricultural and Biosystems Engineering. Department of Chemical Engineering. Department of Civil Engineering. Department of Electrical Engineering. Department of Industrial Engineering. Department of Engineering Science.

page

3.9.m. Example **3.9.m.**

ABSTRACT

DIMASAKA, JOSHUA TABOR. College of Engineering and Agro-Industrial Technology, University of the Philippines Los Baños. December 2017. **Low Frequency Impedance Spectroscopy of Cement Paste Matrix with Amorphous Nanosilica Synthesized from Rice Hull Ash.**

Major Adviser: Prof. Marish S. Madlangbayan

In this paper, the complex impedance spectroscopy was applied to investigate the hydrated cement paste matrix with amorphous nanosilica synthesized from rice hull ash as an admixture against chloride ingression. In recent years, the incorporation of agro-industrial by-products such as the rice hull ash to construction materials has gained interest for creating sustainable, low-cost, and resilient housing. Using low frequency impedance spectroscopy from 100 kHz to 20 MHz, the electrical responses corresponded to the necessary pozzolanic reactions growing from the effect of nanosilica implied by the alternating current conductivity spectra of the samples as the hydration proceeded. Using the Nyquist, Bode, and Cole-Cole plots, an equivalent circuit modelling was employed to characterize the formation of pores and hydrated compounds as potential paths of chloride ingress in the matrix mesostructure. Derived from the Cole-Cole plot, the capacitance was found to be maximum while the resistance was minimum for the sample with 2.0 % nanosilica at 28-day curing period. The trends in electrical spectra generally agreed with the quantitative phase analyses of diffractograms and peak analyses of infrared spectra from 700 to 4000 cm^{-1}.

3.9.n. Example **3.9.n.** (*First page only*)

EXECUTIVE SUMMARY

BARRETTO, ROSELLE PAULASA. College of Engineering and Agro-IndustrialvTechnology, University of the Philippines Los Baños. June 2018. **A Field Practice Report at the Philippine Center for Postharvest Development and Mechanization (Philmech), Science City of Muñoz, Nueva Ecija, Philippines with Focus on Particle Board Production from Mango Seed Husk.**

Major Adviser: Dr. Jessie C. Elauria

In recent years, one of the primary concerns of agricultural engineers is turning waste products into usable forms to reduce the amount of waste materials generated in the country. One of the biggest factors in waste generation come from agricultural products that are being rejected from the time of harvest until they fail to satisfy the export requirement during quality assessment. This is because proper postharvest handling procedures are not maintained and losses in different parts of the transport chain are not regulated. In this field practice report, the author has focused on the possible use mango seed husks by producing particleboards out of it. The study is part of the conducted field practice of the author at the Bioprocess Engineering Division of the Philippine Center for Postharvest Development and Engineering, Science City of Muñoz, Nueva Ecija from June 19 to July 21, 2017. The particleboards produced were made from a mixture of shredded particle husk, unsaturated polyester resin R 10-103 (adhesive), methyl ethyl ketone peroxide (hardener), and cobalt accelerator. The effects of the board's density to the different properties such as moisture content, thickness swelling, water absorbance, and

Article 4

Textual Presentation

Section 4.1. General Guidelines

4.1.a. As a general rule, the discussions in the main text (i.e. INTRODUCTION to RECOMMENDATIONS) shall be written in the third person point of view.

4.1.b. The first line of the paragraph shall be indented $1/2$ inch to the right. The paragraph shall be aligned in both left and right margins (justified). Double spaces shall be maintained between lines and between paragraphs.

4.1.c. To have a neat presentation of ideas, unnecessary marks and symbols in paragraphs shall be avoided. An underscore (underline) shall not be used when defining terms and when emphasizing ideas.

Section 4.2. Text Structure

4.2.a. If possible, only three levels of subsections (major subsection, minor subsection and paragraph headings) should be maintained.

4.2.b. The major subsection shall be positioned at the center of the page, in bold letters, and with the first letter of all significant words capitalized. If the major subsection is composed of five or more words, it shall be arranged in an inverted pyramid form, in single space. Four (4) spaces shall be maintained between the main heading and the first line of the major subsection.

4.2.c. The minor subsection shall be placed three (3) spaces below the major subsection. It shall be positioned at the left side of the page, in bold letters with the first letter of all significant words capitalized. When it runs more than half the page, it shall be cut off with the longer line at the top, and flush to the left margin in single spaced (see Example **4.2.j.**).

4.2.d. Paragraph headings shall be indented $1/2$ inch to the right followed by a period. The paragraph immediately follows after two (2) spaces.

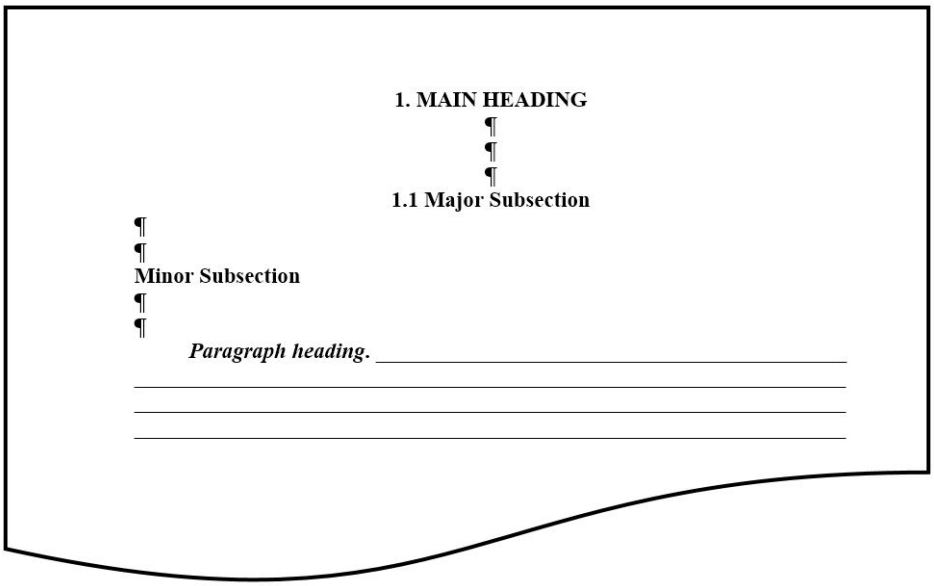
4.2.e. Paragraph headings shall be bold and italicized with only the first letter of the first word capitalized (sentence case).

4.2.f. The paragraph heading shall be three (3) spaces below the minor subsection.

4.2.g. The main headings and major subsections are numbered according to the format presented in Sections 4.3 and 4.4. Minor subsections and paragraph headings are unnumbered.

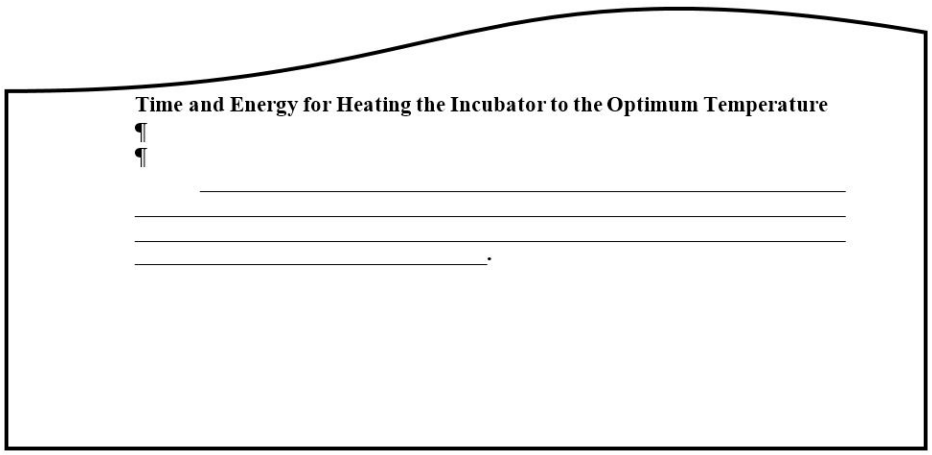
4.2.h. To fully illustrate the format concerning textual presentation, the following structure in Pattern **4.2.i.** shall be adopted throughout the text:

4.2.i. Pattern **4.2.i.**

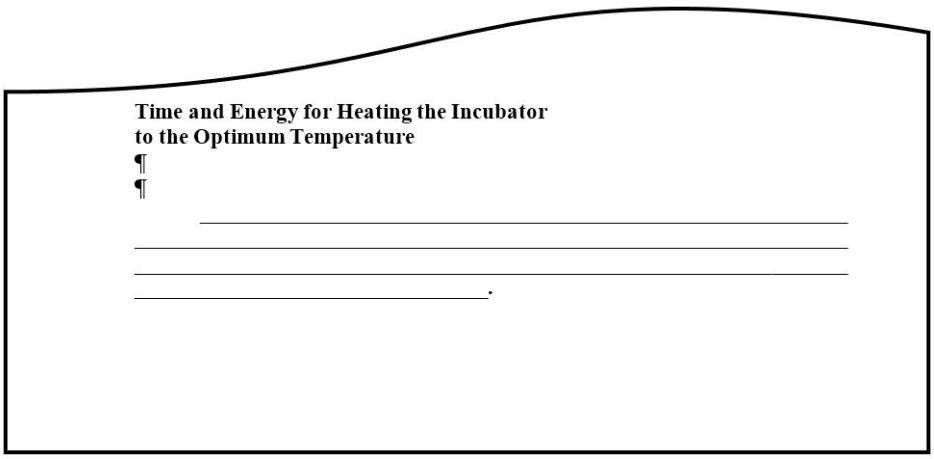


4.2.j. Example **4.2.j.**

Original



Preferred



Section 4.3. Main Heading

4.3.a. The preferred main headings for thesis manuscripts correspond to the different chapters of the main text. These include:

4.3.a.1. 1. INTRODUCTION
4.3.a.2. 2. REVIEW OF LITERATURE
4.3.a.3. 3. MATERIALS AND METHODS
4.3.a.4. 4. RESULTS AND DISCUSSION
4.3.a.5. 5. SUMMARY AND CONCLUSION
4.3.a.6. 6. RECOMMENDATIONS
4.3.a.7. 7. REFERENCES

4.3.b. For field practice manuscripts, the preferred main headings are, but not limited to:

4.3.b.1. 1. INTRODUCTION
4.3.b.2. 2. THEORETICAL BACKGROUND
4.3.b.3. 3. DESCRIPTION OF THE FIELD PRACTICE SITE
4.3.b.4. 4. ACTIVITIES UNDERTAKEN DURING THE FIELD PRACTICE
4.3.b.5. 5. TECHNICAL KNOWLEDGE AND EXPERIENCES GAINED
4.3.b.6. 6. PROBLEMS ENCOUNTERED
4.3.b.7. 7. RECOMMENDATIONS
4.3.b.8. 8. REFERENCES

4.3.c. For special problem manuscripts, the preferred main headings are, but not limited to:

4.3.c.1. 1. INTRODUCTION
4.3.c.2. 2. REVIEW OF LITERATURE or THEORETICAL BACKGROUND
4.3.c.3. 3. MATERIALS AND METHODS
4.3.c.4. 4. RESULTS AND DISCUSSION
4.3.c.5. 5. SUMMARY AND CONCLUSION
4.3.c.6. 6. RECOMMENDATIONS
4.3.c.7. 7. REFERENCES

4.3.d. Each chapter shall be started on a new page, regardless of the space left on the previous page.

4.3.e. The main headings shall be positioned at the topmost line of the page, center aligned and in uppercase and bold letters. In addition, main headings should be numbered according to the lists in Section **4.3.a.** to Section **4.3.c.**

Section 4.4. Major Subsection

4.4.a. For thesis and special problem manuscripts, the preferred major subsections for the INTRODUCTION are, but not limited to:

4.4.a.1. 1.1 Background of the Study
4.4.a.2. 1.2 Significance of the Study
4.4.a.3. 1.3 Objectives of the Study
4.4.a.4. 1.4 Scope and Limitations of the Study
4.4.a.5. 1.5 Time and Place of the Study

4.4.b. “Statement of the Problem” can also be included in the INTRODUCTION.

4.4.c. For field practice manuscripts, the preferred main headings are, but not limited to:

4.4.c.1. 1.1 Background of the Field Practice

4.4.c.2. 1.2 Significance of the Field Practice

4.4.c.3. 1.3 Objectives of the Field Practice

4.4.c.4. 1.4 Scope and Limitations of the Field Practice

4.4.c.5. 1.5 Time and Place of the Field Practice

4.4.d. Major subsections should be numbered according to the lists in Section **4.4.a.** and Section **4.4.c.** Major subsections vary depending on the chapter where they belong. However, they shall be formatted according to the provisions of this article.

Article 5

Table Presentation

Section 5.1. Table Structure and Format

5.1.a. To fully illustrate the format concerning table presentation, the table structure in Pattern **5.1.b.** shall be adopted throughout the manuscript:

5.1.b. Pattern **5.1.b.**

FIRST LEVEL HEADING	FIRST LEVEL HEADING (unit)	FIRST LEVEL HEADING		
		Second Level Heading		Second Level Heading (unit)
		third level heading (unit)	third level heading (unit)	
Row Heading 1				
Row Heading 2				
Row Heading 3				
Row Heading 4				
Row Heading 5				

5.1.c. Tables shall not contain side boxes, instead they shall be presented with double solid lines as top and bottom borders.

5.1.d. The use of too many lines in the table should be avoided. Single solid horizontal lines should be used to separate the different rows and to separate the headings from the entries.

5.1.e. First level headings shall be in uppercase letters. Significant words in the second level headings shall have their first letters capitalized. All third level headings shall have lowercase letters except for proper nouns and acronyms. Dimensions and units are exceptions to these rules, i.e. they shall be presented in their proper formats and symbols, enclosed in parentheses (see Article **12**).

Section 5.2. Table Number and Title

5.2.a. Tables shall be numbered consistently and continuously, independent of the numbering of figures and the numbering of equations.

5.2.b. Table numbers are composed of two numbers separated by a dash. The first number corresponds to the number of the chapter where the table belongs while the second number corresponds to the number of the table as it appears in the chapter.

5.2.c. Table titles shall be preceded by the label "Table X-X" (not "Tab. X-X") followed by a period. The title immediately follows after two (2) spaces. Similarly, tables considered as appendix tables shall be continuously and consistently labelled as "Appendix Table ____."

5.2.d. The table title shall be placed at the top of the table and shall be in sentence case (i.e. only the first letter of the first word is capitalized, and the whole title is followed by a period). A single space shall be maintained between the last line of the table title and the top double line border of the table.

5.2.e. The table title shall be positioned relative to the table and not relative to the page. For consistency, the table title, including the label "Table X-X." shall be aligned to the left edge of the table.

5.2.f. In any case, the table title shall not extend beyond the table's width. If the title length exceeds the table's width, the title shall be cut off, and the remaining part is aligned to the start of the title (not the label), in single space.

5.2.g. Example **5.2.g.**

Table 4-6. Hourly power consumption of different incubator components using two methods of incubation.

COMPONENT	CONVENTIONAL		SOLAR AIDED	
	Nominal Consumption (kWh)	Actual Consumption (kWh)	Nominal Consumption (kWh)	Actual Consumption (kWh)

Section 5.3. Long Tables

5.3.a. As a general recommendation, long tables should be used sparingly in the main text. Instead, they should be included in the appendix. If possible, only significant data should be included in a table used for discussion. The reader may be referred to the appendix for details.

5.3.b. In this section, a long vertical table is defined as a table which has a total height exceeding the allowable text height (paper height less top and bottom margins) in a page. On the other hand, a long horizontal table is a table which has a total width exceeding the allowable text width (paper width less left and right margins) in a page.

5.3.c. In titling continued long vertical and horizontal tables, there is no need to indicate the table title, instead use "Table X-X continued . . ." or "Appendix Table ____ continued . . ." However, table headings with proper heading and border formats shall be provided (see Example **5.3.d.** for vertical table.)

5.3.d. Example **5.3.d.**

Appendix Table 4. Raw and computed data for ventilation rate calculation.

DATE	TIME	AMBIENT				POULTRY HOUSE			
		Dry Bulb (°C)	Wet Bulb (°C)	RH (%)	Enthalpy (kJ/kg)	Ave Temp, (°C)	Ave RH (%)	Enthalpy (kJ/kg)	Specific Volume (m^3/kg)
24-Aug-07	7:00 PM	29.0	25.0	72.6	76.32	38.4	62.1	108.16	0.921
24-Aug-07	8:00 PM	28.5	24.0	69.1	72.19	38.2	57.5	102.56	0.918

Appendix Table 4 continued . . .

DATE	TIME	AMBIENT				POULTRY HOUSE			
		Dry Bulb (°C)	Wet Bulb (°C)	RH (%)	Enthalpy (kJ/kg)	Ave Temp, (°C)	Ave RH (%)	Enthalpy (kJ/kg)	Specific Volume (m^3/kg)
25-Aug-07	11:00 PM	26.5	23.0	74.5	68.30	38.5	60.3	106.31	0.920
25-Aug-07	12:00 PM	26.0	23.0	77.7	68.32	38.3	60.9	106.5	0.920

5.3.e. For long horizontal tables, the author may opt to present the table in a landscape page or to cut the table so that it will be accommodated in two or more portrait pages.

5.3.f. If a long horizontal table is cut, it should be done in way so that the resulting table widths are approximately similar. In addition, row headings shall be retained in the continued portions of the table (see Example **5.3.g.**)

5.3.g. Example **5.3.g.**

Table Z-Z. Position and orientation of a long horizontal table in a landscape page.

FIRST LEVEL HEADING 1	FIRST LEVEL HEADING 2	FIRST LEVEL HEADING 3	FIRST LEVEL HEADING 4
Row Heading 1			
Row Heading 2			
Row Heading 3			
Row Heading 4			
Row Heading 5			

Table Z-Z continued . . .

FIRST LEVEL HEADING 1	FIRST LEVEL HEADING 5	FIRST LEVEL HEADING 6	FIRST LEVEL HEADING 7
Row Heading 1			
Row Heading 2			
Row Heading 3			
Row Heading 4			
Row Heading 5			

5.3.h. Long horizontal tables in a landscape page should be oriented so that the table title is on the left side of the page (see Example **5.3.j.**).

5.3.i. The page number format for tables laid-out in a landscape page shall follow the provisions presented in Section **8.3**.

5.3.j. Example **5.3.j.**

Table Z-Z. Position and orientation of a long horizontal table in a landscape page.

FIRST LEVEL HEADING 1	FIRST LEVEL HEADING 2	FIRST LEVEL HEADING 3	FIRST LEVEL HEADING 4	FIRST LEVEL HEADING 5
Row Heading 1				
Row Heading 2				
Row Heading 3				
Row Heading 4				
Row Heading 5				

page

Section 5.4. Format of Table Entries

5.4.a. All entries, including headings, shall be single-spaced within a cell and shall be centered vertically.

5.4.b. If possible, entries should also be centered horizontally. However, phrases are preferably flushed to the left margin.

5.4.c. Consistency on the format of values and entries shall be observed. In a column or row populated by numerical values, the number of decimal places shall be the same in each cell, depending on the desired accuracy.

5.4.d. Example **5.4.d.**

Table 4-13. Empirical heating values of seaweed samples at various moisture contents.

MOISTURE CONTENT (%)	HEATING VALUE (kJ/kg)		
	Roxas City Samples	Ivisan Samples	Pilar Samples
22	9,406.76	9,927.24	10,174.00
26	8,923.08	9,486.92	9,744.00
30	8,439.40	9,046.60	9,314.00
34	7,955.72	8,606.28	8,884.00
38	7,472.04	8,165.96	8,454.00

5.4.e. Fractional and decimal values shall not be mixed in the same column or row.

5.4.f. Units of different systems (i.e. SI and English) shall not be mixed in the same column or row. The values shall be converted from one system to another for consistency.

Section 5.5. Table Footnote and Citation

5.5.a. Footnotes to be included in the table shall be positioned below the bottom double line border, single-spaced and flushed to the left edge of the table (see Example **5.5.c.**).

5.5.b. For tables sourced from references, the source shall be indicated below the bottom double line border (or footnote, if any), flushed to the left edge of the table and in italics. The source shall contain the author and year of publication (see Example **5.5.d.**).

5.5.c. Example **5.5.c.**

Table 4-19. Mean water temperature observed in different treatments*.

TREATMENT	TEMPERATURE (°C)	
	Location 1	Location 2
1	38.17	38.98
2	38.49[a]	38.66
3	38.51[a]	36.62
4	38.56	38.82
5	38.22	37.72
6	37.93	36.38

*In a column, means followed by the same letter are not significantly different at $p<0.050$.

5.5.d. Example **5.5.d.**

Table 2-2. Selected properties of conventional biomass resources.

TYPES	HEATING VALUE (MJ/kg)	PERCENT MOISTURE	PERCENT ASH
Fruit stems	5.0	63	-
Oil-palm husks	7.0-8.0	55	5.00
Oil-palm fibers	7.0-8.0	55	10.0
Bagasse	7.7-8.0	40-60	1.7-3.8
Phaeophyta	9.0-11.0	-	24.0-45.0
Chlorophyta	8.0-13.0	-	24.0-50.0
Giant Brown Kelp	10.3	-	10.3
Rice Husks	14.0	9	19.0
Maize Cobs	13.0-15.0	10-20	2.0
Coffee husks	16.0	10	0.6
Cocoa husks	13.0-16.0	7-9	7.0-14.0
Wood	8.4-17.0	10-60	0.3-1.7

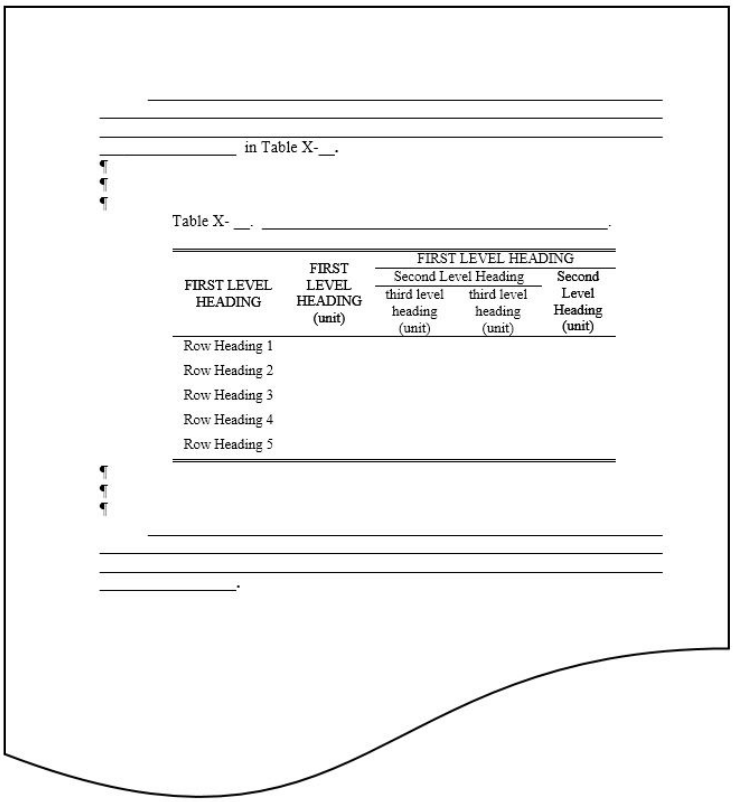
Source: Alburo et al., 2010

Section 5.6. Table Presentation in the Text

5.6.a. Tables can be presented ***after*** they are mentioned in the text or they could be placed as appendix tables.

5.6.b. Tables shall be positioned at the center of the page. They could be placed along with the text or could be in a separate page. If placed with the text, three (3) spaces shall be maintained between the table title and the last line of the preceding text. Likewise, three (3) spaces shall also be provided between the bottom of the table and the first line of the succeeding text.

5.6.c. Pattern **5.6.c.**



Article 6

Figure Presentation

Section 6.1. Figure Number and Title

6.1.a. Figures shall be numbered consistently and continuously, independent of the numbering of tables and the numbering of equations.

6.1.b. Figure numbers are composed of two numbers separated by a dash. The first number corresponds to the number of the chapter where the figure belongs while the second number corresponds to the number of the figure as it appears in the chapter.

6.1.c. Figure caption shall be preceded by the label “Figure Y-Y.” (not “Fig. Y-Y”) followed by a period. The caption immediately follows after two (2) spaces. Similarly, figures considered as appendix figures shall be continuously and consistently labelled as “Appendix Figure ____.”

6.1.d. The caption shall be placed at the bottom of the figure and shall be in sentence case (i.e. only the first letter of the first word is capitalized, and the whole caption is followed by a period). A single space shall be maintained between the bottom edge of the figure and the first line of the figure caption.

6.1.e. The figure caption shall be positioned relative to the figure and not relative to the page. For consistency, the figure caption, including the label “Figure Y-Y.” shall be center-aligned relative to the figure.

6.1.f. In any case, the whole figure caption shall not extend beyond the figure’s width. If the caption length exceeds the figure’s width, the caption shall be cut off, and the remaining part is aligned to the start of the caption (not the label), in single space.

6.1.g. The guidelines stated in the preceding provisions are exemplified in Example **6.1.h.**

6.1.h. Example **6.1.h.**

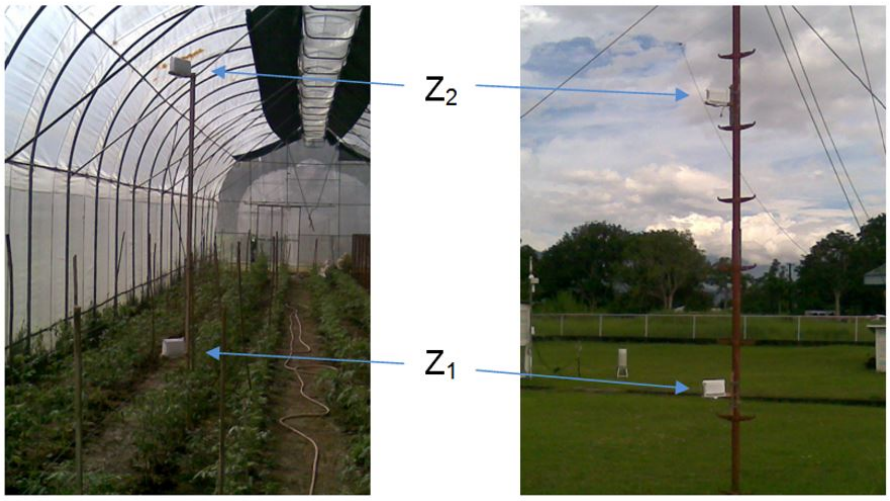


Figure 3-4. Data logger set-up for Bowen ratio measurement.

Section 6.2. Figure Footnote and Citation

6.2.a. Footnotes shall be positioned immediately after the figure caption. It shall be introduced by the italicised term "*Note:*" and the note shall follow after two (2) spaces (see Example **6.2.b.**).

6.2.b. Example **6.2.b.**

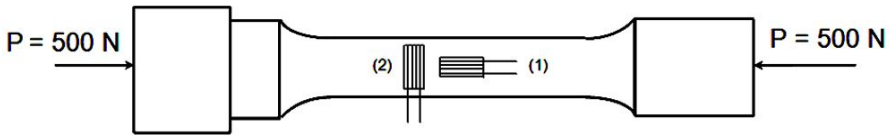


Figure 4-12. Strain gauge positions in the load cell. *Note:* Gauges (3) and (4) were positioned at the opposite side of the load cell.

6.2.c. For figures sourced from references, the source shall be indicated below the figure caption (or footnote, if any), aligned to the start of the figure caption title and in italics. The source shall contain the author (or title, see Section **10.1.j.**) and year of publication and it shall be introduced by the italicised term "*Source:*" (see Example **6.2.d.**).

6.2.d. Example **6.2.d.**

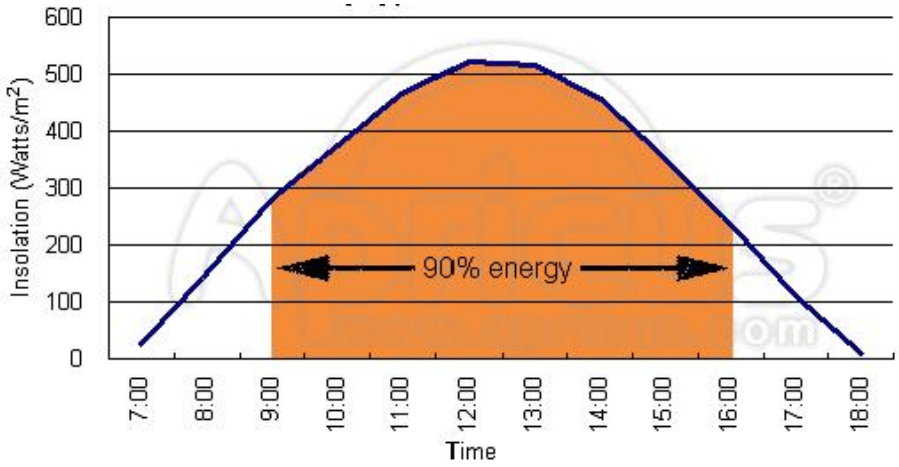


Figure 3-9. Twelve-hour day typical insolation curve.
Source: Apricus, 2006.

Section 6.3. Charts

6.3.a. The most appropriate chart type shall be selected to show the relationship between variables (e.g. line charts should be used when showing trends, bar charts should be used when comparing values, pie charts should be used to show the contribution of each value to a total, etc).

6.3.b. Consistency on the format of graphs shall be observed. All axis labels, axis titles and legend titles shall be formatted to Times New Roman font style.

6.3.c. Axis titles shall be in title case (i.e. the first letter of all significant words are capitalized). Appropriate units, enclosed in parentheses, follow.

6.3.d. In an axis with numerical labels, the number of decimal places shall be the same in each interval, depending on the desired accuracy. Fractional and decimal values shall not be mixed in the same axis.

6.3.e. Preferably, gridlines should be omitted. Legends should be positioned in vacant spaces in the plot area. If the plot area is crowded, the legends may be placed outside the plot area.

6.3.f. Preferably, bar and pie charts should be shaded using hatched lines instead of regular colors. This is to ensure that the variations in the charts are still visible even when the figure is printed in black and white ink.

6.3.g. Equations and R^2 values which are usually included in a scatter chart should be positioned as close as possible to the line or points they describe.

6.3.h. The guidelines stated in the preceding provisions are exemplified in Examples **6.3.i.** and **6.3.j.**

6.3.i. Example **6.3.i.**

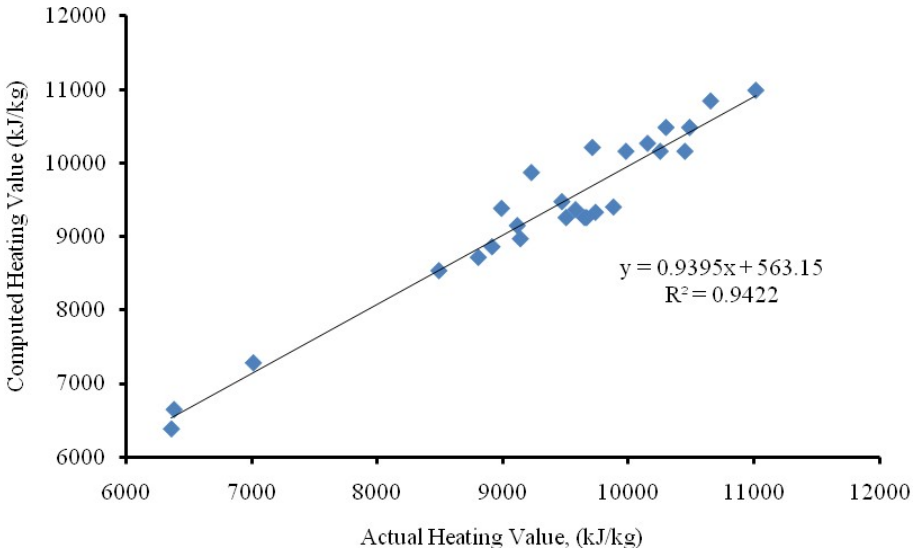


Figure 4-21. Computed heating values vs. actual heating values.

6.3.j. Example **6.3.j.**

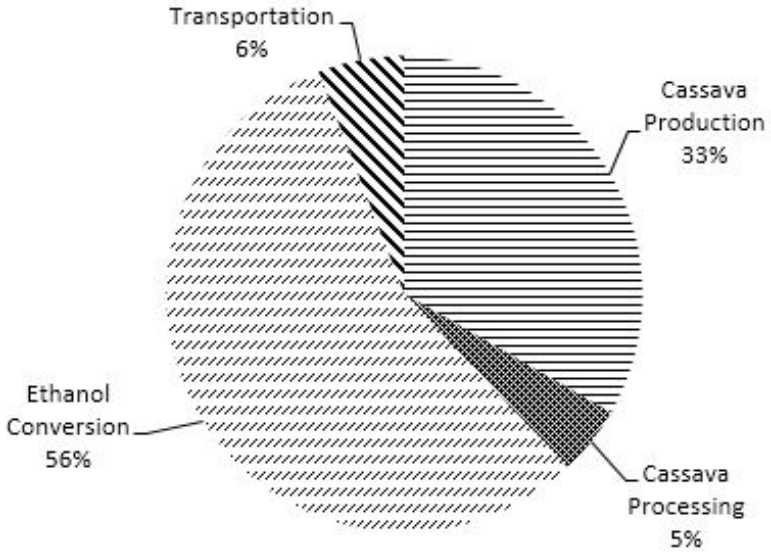


Figure 4-8. Input energy allocation for different segments in cassava bioethanol production.

Section 6.4. Landscape Figures, Maps and Plans

6.4.a. Figures laid-out in a landscape page should be oriented so that the figure caption is on the right side of the page and below the figure as in portrait pages (see also Example **8.3.c.**)

6.4.b. The page number format for figures laid-out in a landscape page shall follow the provisions presented in Section **8.3**.

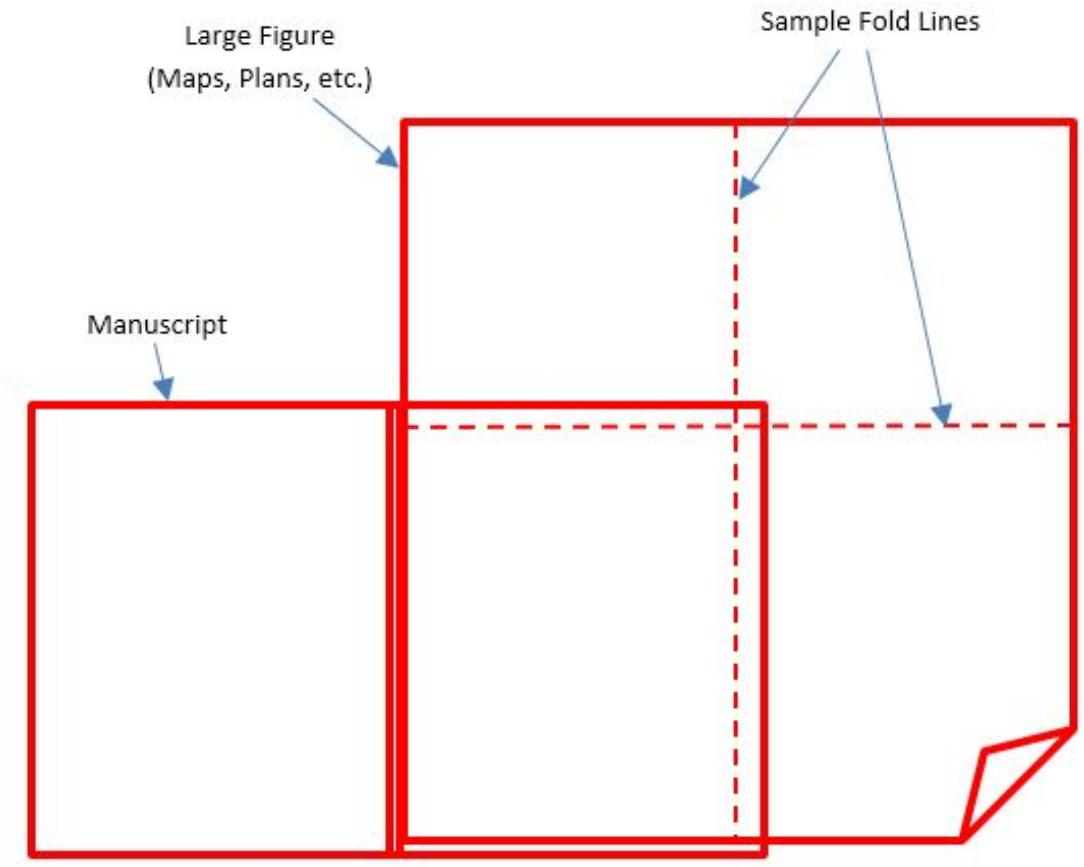
6.4.c. Maps, floor plans and other engineering drawings drawn in paper sizes larger than a 'letter size' paper, collectively termed 'large figures' in this article, may be included in the manuscript, preferably in the appendices section.

6.4.d. To be included in the bound copies of the manuscript, large figures shall be folded to conform to the dimensions of the other pages. Authors are tasked to explore different ways of folding large figures depending on their requirements.

6.4.e. Authors are strongly encouraged to seek professional advice from bindery personnel as to the best way of including folded pages in the bound copies of the manuscript. As a general recommendation, the folded page should be smaller than a 'letter size' paper. This is to prevent it from being cut since all the edges of the manuscript are usually trimmed off during the binding process.

6.4.f. Large maps and plans may be assigned with imaginary page numbers. However, these imaginary page numbers shall be consistent and in sequence with their neighbouring pages.

6.4.g. Example **6.4.g.**



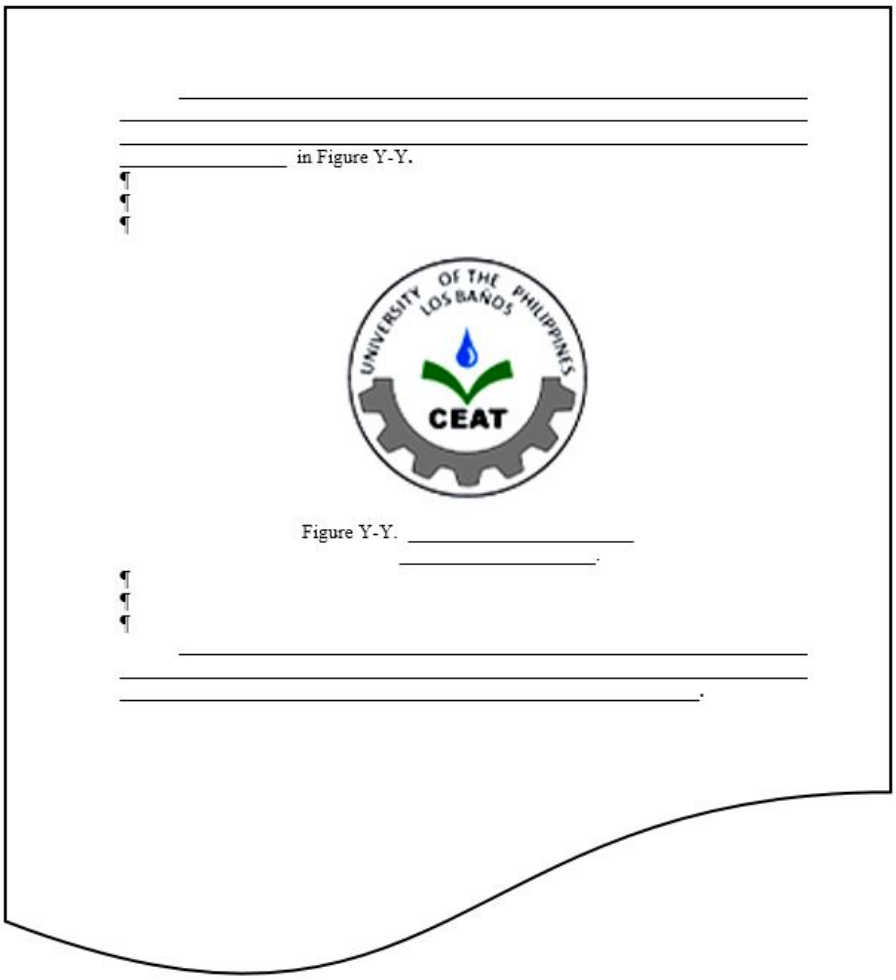
Section 6.5. Figure Presentation in the Text

6.5.a. Figure shall be clear and do not contain unnecessary marks. Preferably, figures other than charts should be printed in colored ink.

6.5.b. Figures can be presented ***after*** they are mentioned in the text or they could be placed as appendix figures.

6.5.c. Figures shall be positioned at the center of the page. They could be placed along with the text or could be in a separate page. If placed with the text, three (3) spaces shall be maintained between the top edge of the figure and the last line of the preceding text. Likewise, three (3) spaces shall also be provided between the figure caption and the first line of the succeeding text.

6.5.d. Pattern **6.5.d.**



Article 7

Equation Presentation

Section 7.1. Equation Format

7.1.a. Equations between quantities are preferred over equations between numerical values. Equations shall be expressed in their mathematically correct form.

7.1.b. The variables shall be represented by letters or symbols, the meanings of which are explained in connection with the equation.

7.1.c. All the terms in the equations shall be italicized. However, the definition of terms shall be presented in normal format.

7.1.d. As far as possible, symbols having more than one level of subscript or superscript shall be avoided (see Example **7.1.e.**).

7.1.e. Example **7.1.e.**

$Q_{l,max}$ is preferable to $Q_{l_{max}}$

Section 7.2. Definition of Equation Terms

7.2.a. Each term in the equation, whether a constant or a variable, shall be defined after the equation is presented. For variables requiring a specific unit, the unit shall be enclosed in parenthesis and shall be placed at the end of the definition.

7.2.b. The definition of terms shall be introduced by the word “where:” followed by an enumeration of the terms with their corresponding definitions. The word “where” shall be flushed to the left margin of the page and shall be positioned three (3) spaces below the last line of the equation.

7.2.c. The list of terms shall be single-spaced, each term shall be indented five (5) spaces to the right, reckoned from the word “where:” (see Example **7.2.d.**)

7.2.d. Example **7.2.d.**

$$L = 2C + \frac{\pi}{2}(D_L + D_S) + \frac{(D_L - D_S)^2}{4C}$$

¶
¶
where:

L	is the belt pitch length for an open drive (inches)
C	is the center to center distance (inches)
D_S	is the pitch diameter of small pulley (inches)
D_L	is the pitch diameter of large pulley (inches)
π	is the number 3.1415926. . .

Section 7.3. Equation Number

7.3.a. Equations shall be numbered consistently and continuously, independent of the numbering of tables and the numbering of figures.

7.3.b. Equation numbers are composed of two numbers separated by a dash. The first number corresponds to the number of the chapter where the equation belongs while the second number corresponds to the number of the equation as it appears in the chapter.

7.3.c. The equation number shall be preceded by the label “Equation Z-Z” (not “Eqn. Z-Z”). The equation number and label shall be italicized and enclosed in parentheses.

7.3.d. The equation number shall be flushed to the right margin of the page, directly opposite the equation it describes.

7.3.e. Example **7.3.e.**

$$T_R = \frac{F d_m}{2} \frac{(L + \pi f d_m}{\pi d_m - fL} \qquad (\textit{Equation 3-11})$$

¶
¶
where:

T_R	is the torque required to lift the axial load
F	is the axial load carried by the screw
d_m	is the screw mean diameter
f	is the coefficient of friction between the nut and the screw
L	is the screw lead
π	is the number 3.1415926. . .

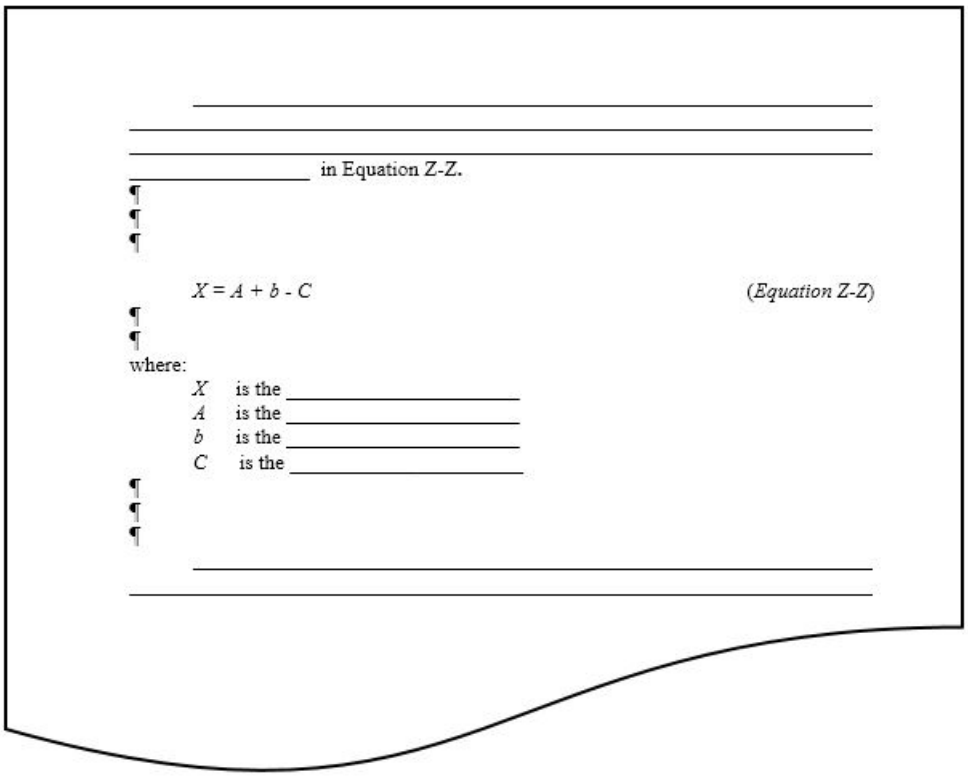
Section 7.4. Equation Presentation in the Text

7.4.a. Equations can be presented ***after*** they are mentioned in the text or they could be placed in the appendix.

7.4.b. Equations shall be indented 1/2 inch to the right. If placed with the text, three (3) spaces shall be maintained between the first line of the equation and the last line of the preceding text. Likewise, three (3) spaces shall also be provided between the last defined term of the equation and the first line of the succeeding text.

7.4.c. If the equation is too long, it shall be cut off in such a way that it retains its correct form and meaning.

7.4.d. Example **7.4.d.**



_____
_____
_____
_____ in Equation Z-Z.
¶
¶
¶

$X = A + b - C$ (*Equation Z-Z*)

¶
¶
where:

X is the _____
A is the _____
b is the _____
C is the _____

¶
¶
¶

_____
_____

Article 8

Pagination

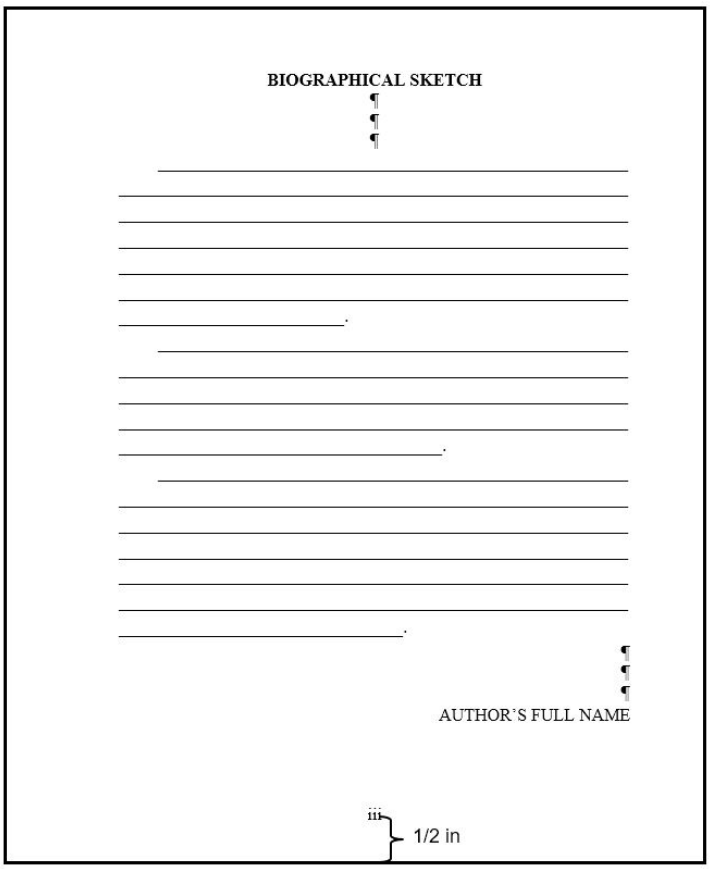
Section 8.1. Pagination for Preliminary Pages

8.1.a. Preliminary pages shall contain lowercase roman numeral page numbers.

8.1.b. Page numbers shall be positioned at the bottom of each page, center-aligned and placed 1/2 inch from the bottom edge of the page.

8.1.c. The TITLE PAGE and the APPROVAL PAGE shall have imaginary page numbers.

8.1.d. Example **8.1.d.**



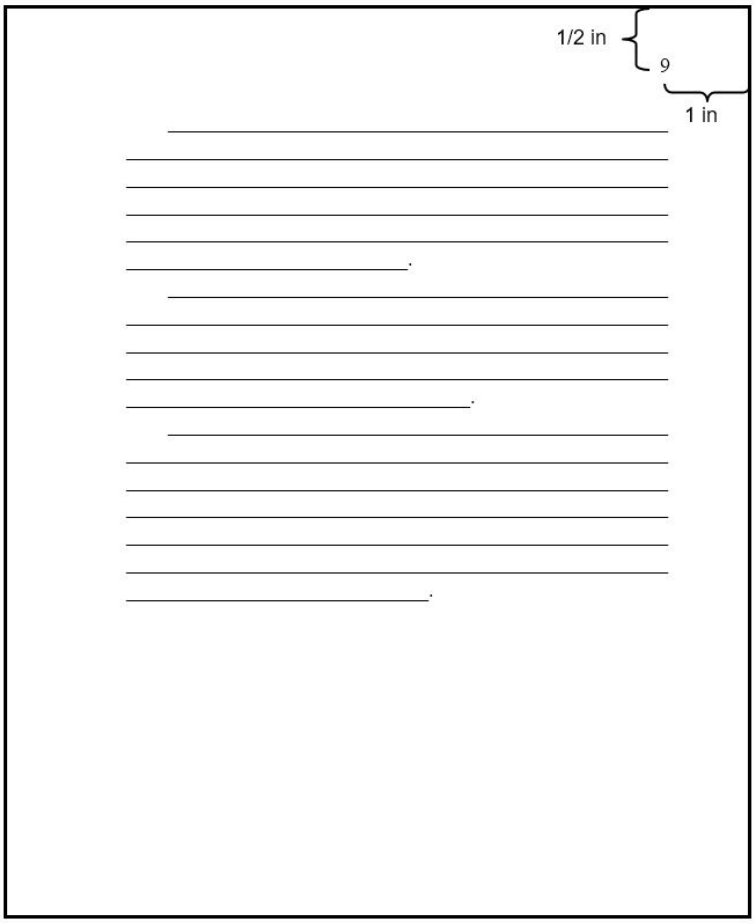
Section 8.2. Pagination for the Main Body

8.2.a. The main body of the manuscript shall contain arabic numeral page numbers.

8.2.b. Page numbers shall be positioned at the upper right corner of the page, positioned one (1) inch from the right side and $1/2$ inch from the topside.

8.2.c. Pages containing the main headings (INTRODUCTION, REVIEW OF LITERATURE, THEORETICAL BACKGROUND, MATERIALS AND METHODS, RESULTS AND DISCUSSION, SUMMARY AND CONCLUSION, RECOMMENDATIONS, REFERENCES, APPENDICES) shall have imaginary page numbers.

8.2.d. Example **8.2.d.**

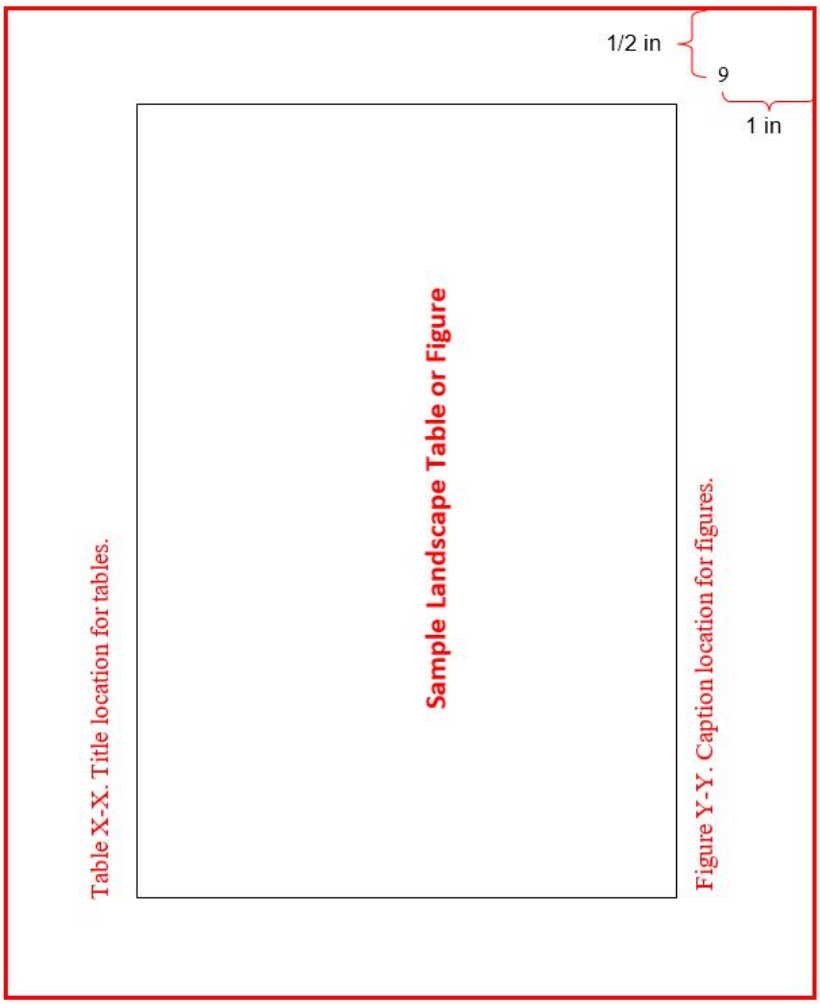


Section 8.3. Pagination for Landscape Pages

8.3.a. Page number format, orientation and sequence of landscape pages shall conform to the provisions presented in Section **8.2**.

8.3.b. It shall be emphasized that in landscape pages, the orientation and location of the page number shall still follow the format shown in Example **8.3.c.** (similar to portrait pages). In addition, the page number shall conform to the existing page sequence in the manuscript. Authors are strongly encouraged to explore options so that the provisions of this section are followed.

8.3.c. Example **8.3.c.**



Article 9

Appendix Presentation

Section 9.1. Appendix Format

The items that are included in the appendices, appendix tables and appendix figures shall be formatted according to the guidelines governing the presentation of texts, tables, figures and equations.

Section 9.2. Appendix Letter, Number and Title

9.2.a. Appendices shall be lettered chronologically starting from “APPENDIX A”.

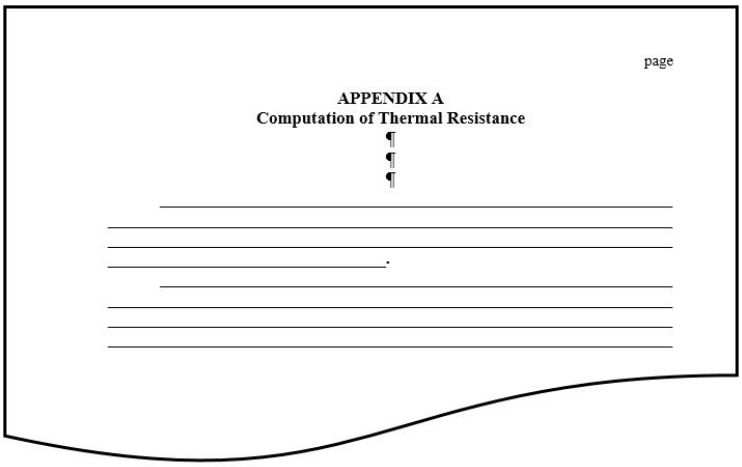
9.2.b. The heading “APPENDIX ____” shall be positioned at the topmost line of the page, center aligned and in uppercase and bold letters.

9.2.c. The appendix title shall be positioned at the center of the page, below the heading “APPENDIX ____”, in bold letters, and with the first letter of all significant words capitalized.

9.2.d. If the appendix title is composed of five or more words, it shall be arranged in an inverted pyramid form, in single space.

9.2.e. Three (3) spaces shall be maintained between the last line of the appendix title and the first line of the first paragraph.

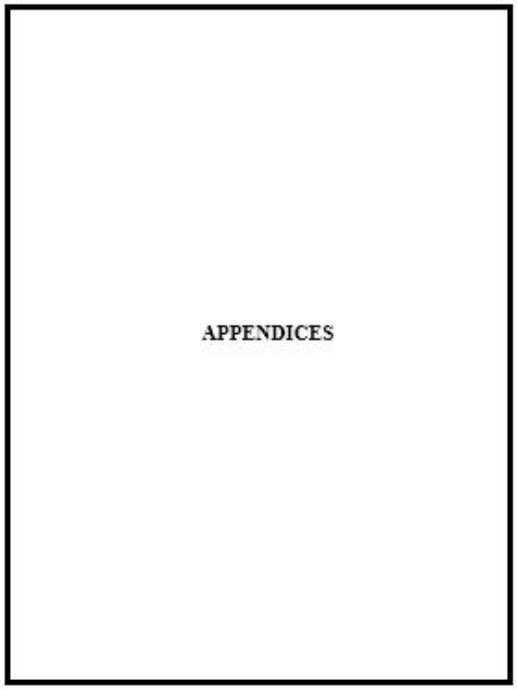
9.2.f. Example **9.2.f.**

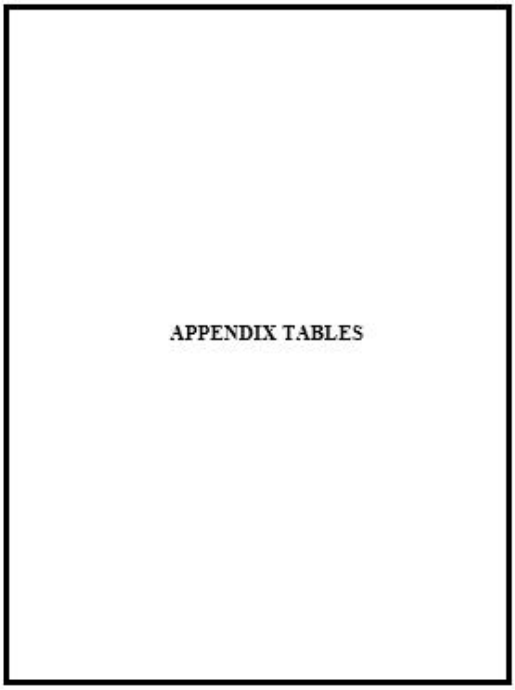


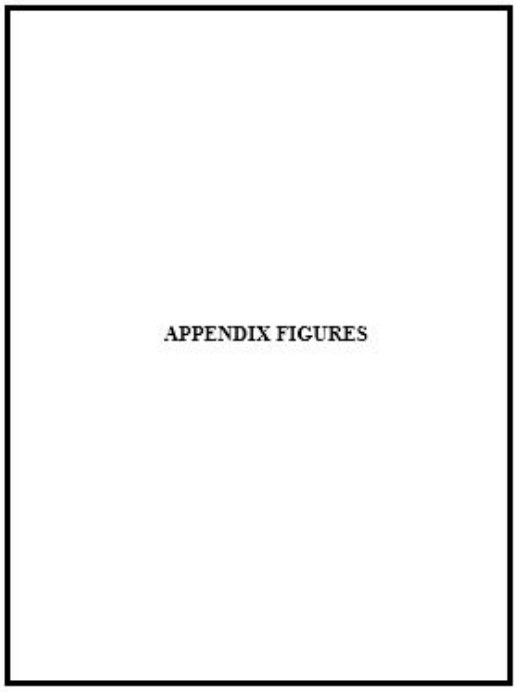
Section 9.3. Appendix Presentation in the Text

9.3.a. The appendices shall be introduced by a single page labelled “APPENDICES”. This label shall be in uppercase and bold letters, and centered vertically and horizontally in the page. This page shall have an imaginary page number. Similar pages shall be provided for appendix tables and appendix figures.

9.3.b. Example **9.3.b.**







9.3.c. Each appendix shall be started on a new page, regardless of the space left on the previous page.

Article 10

References Presentation

Section 10.1. General Format

10.1.a. The bibliographic formats contained in this article were adapted from the American Psychological Association (APA) style of bibliographic citation ***with modifications***. Additional formatting guidelines are prescribed in subsequent paragraphs.

10.1.b. Authors' name shall be all in uppercase letters, surname shall be indicated first before the first name and middle initial.

10.1.c. When dealing with more than one author, the ampersand "&" shall be used instead of the word "and".

10.1.d. In books or articles with up to six authors, all the author names shall be written. In cases where there are more than six authors, the first six names shall be written, followed by three periods, an ampersand "&", and then followed by the name of the last author (see Pattern **10.1.e.**).

10.1.e. Pattern **10.1.e.**

AUTHOR, A.A.A., AUTHOR, B.B.B., AUTHOR, C.C.C., AUTHOR, D.D.D., AUTHOR, E.E.E., & AUTHOR, F.F.F. (Year of publication). Book title in sentence case (edition if later than the first). Place of Publication: Publisher.

AUTHOR, A.A.A., AUTHOR, B.B.B., AUTHOR, C.C.C., AUTHOR, D.D.D., AUTHOR, E.E.E., AUTHOR, F.F.F., . . . & AUTHOR, Z.Z.Z. (Year of publication). Book title in sentence case (edition if later than the first). Place of Publication: Publisher.

10.1.f. Titles of books and articles shall be presented in sentence case (i.e. only the first letter of the first word is capitalized, including any proper noun or acronym).

10.1.g. The edition number (other than the first edition) shall be indicated after the title. It shall be enclosed in parenthesis and should be presented similar to this example: (7th ed.).

10.1.h. The elements of the entry (e.g. author, date, title, location, publisher, etc) shall be followed by a period and a space.

10.1.i. Terms like "Inc.", "Ltd", "Co.", "Company" etc. shall be omitted when presenting the publisher.

10.1.j. For works with no identified authors, the book or article title shall be placed in the author's position. However, such title shall be in sentence case and shall start at the first significant word of the title (see Pattern **10.1.k.**).

10.1.k. Pattern **10.1.k.**

Book title in sentence case. (Year of publication). Place of Publication: Publisher.

10.1.l. For undated references, the abbreviation “n.d.” shall be indicated in the space provided for the publication date. The word “undated” shall not be used.

10.1.m. The entries shall be presented in hanging indent style.

10.1.n. Double spaces shall be maintained between entries but single space should be maintained within entries (see Pattern **10.1.e.**).

10.1.o. Italics (except for non-English terms and scientific names), underscores, and quotations marks shall not be used in the entries.

10.1.p. The reference list shall be arranged alphabetically by author surname or by title when the entry has no author.

10.1.q. For multiple works with the same author, the entries shall be ordered chronologically from the earliest. For multiple works with the same author in the same year, the entries shall be ordered alphabetically by title. In addition, a lower case letter shall be added to the year of publication (e.g. 2010a, 2010b).

10.1.r. All entries shall be included in the reference list. Books, journal articles, web pages, etc shall not be listed in separate sections.

10.1.s. More specific formats for different cases are prescribed in subsequent sections.

Section 10.2. Book by a Single Author

10.2.a. Pattern **10.2.a.**

AUTHOR, A.A.A. (Year of publication). Book title in sentence case, (edition if later than the first). Place of Publication: Publisher.

10.2.b. Example **10.2.b.**

SPARK, C.S. (2002). Contemporary engineering economics (3rd ed.). Jurong, Singapore: Pearson Education South Asia PTE.

Section 10.3. Book by Two or More Authors

10.3.a. Pattern **10.3.a.**

AUTHOR, A.A.A., AUTHOR, B.B.B., . . . & AUTHOR, C.C.C. (Year of publication). Book title in sentence case (edition if later than the first). Place of Publication: Publisher.

10.3.b. Example **10.3.b.**

GUZELLA, L. & ONDER, C.H. (2010). Introduction to modelling and control of internal combustion engine systems (2nd ed.). Germany: Springer.

10.3.c. Example **10.3.c.**

BREYER, D.E., FRIDLEY, K.J., COBEEN, K.E. & POLLOCK, D.G. (2007). Design of wood structures ASD/LRFD (6th ed.). New York: Mc-Graw Hill.

Section 10.4. Book by an Organization or Institution

10.4.a. Pattern **10.4.a.**

NAME OF THE INSTITUTION. (Year of publication). Book title in sentence case (edition if later than the first). Place of Publication: Publisher.

10.4.b. Example **10.4.b.**

FOREST PRODUCTS LABORATORY. (1999). Wood handbook – Wood as an engineering material. Madison Wisconsin: USDA Forest Service.

Section 10.5. Edited Book

10.5.a. Pattern **10.5.a.**

EDITOR, A.A.A. (Ed.). (Year of publication). Book title in sentence case (edition if later than the first). Place of Publication: Publisher.

10.5.b. For works with more than one editor, the editors' names shall be presented according to the patterns described in Section **10.1.e.** and Section **10.3** of this article, and the term "(Ed.)" is changed to "(Eds.)".

10.5.c. Example **10.5.c.**

KUTZ, M. (Ed.). (2007). Handbook of farm, dairy, and food machinery. New York: William Andrew.

10.5.d. Example **10.5.d.**

CHAKRAVERTY, A., MUJUMDAR, A.S., RAGHAVAN, G.S.V. & RAMASWAMY, H.S. (Eds.). (2003). Handbook of postharvest technology. New York: Marcel Dekker.

Section 10.6. Article or Chapter in an Edited Book

10.6.a. Pattern **10.6.a.**

AUTHOR OF CHAPTER, A.A.A. (Year of publication). Chapter title in sentence case. In A.A.A. Editor/s (Ed/s.), Book title in sentence case (edition if later than the first), (pp. start-end page number of chapter). Place of Publication: Publisher.

10.6.b. For works with more than one author/editor, the authors'/editors' names shall be presented according to the patterns described in Section **10.1.e.** and Section **10.3** of this article, and the term "(Ed.)" is changed to "(Eds.)".

10.6.c. Example **10.6.c.**

CURTISS, P.S. (2001). Control fundamentals. In J.F. Kreider (Ed.), Handbook of heating, ventilation and air conditioning, (pp. 339-383). Boca Raton, Florida: CRC Press.

Section 10.7. Several Volumes in a Multivolume Work

10.7.a. Pattern **10.7.a.**

AUTHOR, A.A.A. (Year of publication of 1st vol – year of publication of last volume). Book title in sentence case, (Vols. 1-last). Place of Publication: Publisher.

10.7.b. The "AUTHOR" described by Pattern **10.7.a.** may be the author/s of the volumes, editor/s of the volumes, or the organization responsible in writing the volumes.

10.7.c. For works with more than one author/editor, the authors'/editors' names shall be presented according to the patterns described in Section **10.1.e.** and Section **10.3** of this article, and the term "(Ed.)" is changed to "(Eds.)".

10.7.d. Example **10.7.d.**

AGRICULTURAL MACHINERY TESTING AND EVALUATION CENTER [AMTEC]. (2000 – 2005). Philippine agricultural engineering standards, (Vols. 1-5). UPLB, College, Laguna: AMTEC.

Section 10.8. Website or Webpage

10.8.a. Pattern **10.8.a.**

AUTHOR, A.A.A. (Year when the site was produced or the document was published). Document title in sentence case. Retrieved Month Day, Year from full internet address

10.8.b. Example **10.8.b.**

DOVEY, M.R. (2010). Solar-powered fluidyne (Fluid piston stirling cycle engine). Retrieved April 4, 2011 from http://www.iedu.com/DeSoto/Fluidyne/Dyne.html

10.8.c. The internet address shall not be ended by a period. In addition, the hyperlink associated with such address shall be removed.

10.8.d. The internet address may be cut if too long, in order to comply with the required alignment (justified) of each entry.

Section 10.9. Website of an Organization or Institution

10.9.a. Pattern **10.9.a.**

ORGANIZATION OR INSTITUTION. (Year when the site was produced or the document was published). Document title in sentence case. Retrieved Month Day, Year from full internet address

10.9.b. Example **10.9.b.**

NATIONAL RENEWABLE ENERGY LABORATORY. (2008). Biofuels. Retrieved January 30, 2009 from http://www.nrel.gov./learning/re_biofuels.html

10.9.c. See also Sections **10.8.c.** and **10.8.d.**

Section 10.10. Electronic Book

10.10.a. For an electronic book (e-book), the guidelines stated in Sections **10.2** to **10.7** of this article apply, but the phrase "[Electronic version]" is added after the title of the book.

10.10.b. Pattern **10.10.b.**

AUTHOR, A.A.A. (Year of publication). Book title in sentence case (edition if later than the first) [Electronic version]. Place of Publication: Publisher.

10.10.c. Example **10.10.c.**

SOLOMAN, S. (2010). Sensors handbook (2nd ed.) [Electronic version]. New York: Mc-Graw Hill.

Section 10.11. Dictionary or Encyclopedia Article

10.11.a. Pattern **10.11.a.**

AUTHOR, A.A.A. (Year of publication). Title of encyclopedia entry/article in sentence case. In title of encyclopedia (Vol number, pp. start page – end page of the article). Place of Publication: Publisher.

10.11.b. Example **10.11.b.**

Agriculture. (2004). In Webster's universal english dictionary (p. 9). Scotland: Geddes & Grosset.

Section 10.12. Dictionary or Encyclopedia Article (Online)

10.12.a. Pattern **10.12.a.**

AUTHOR, A.A.A. (Year of publication). Title of encyclopedia entry/article in sentence case. In title of encyclopedia. Retrieved Month Day, Year from full internet address

10.12.b. Example **10.12.b.**

SMITH, R.J., (2011). Engineering. In Encyclopedia Britannica. Retrieved April 24, 2011 from http://www.britannica.com/EBchecked/topic/187549/engineering

Section 10.13. Journal Article

10.13.a. Pattern **10.13.a.**

AUTHOR, A.A.A. (Year when the article was published). Article title in sentence case. Title of the journal, volume number if available (issue number), inclusive pages.

10.13.b. Example **10.13.b.**

BITOG, J.P.P., ELAURIA, J.C., ELEPAÑO, A.R. & RESURRECCION, A.N. (2009). Design, fabrication and evaluation of a direct-fired corncob furnace for corn drying. Philippine Journal of Agricultural and Biosystems Engineering, 7, 3-15.

Section 10.14. Journal Article (Electronic with DOI)

10.14.a. DOI stands for Digital Object Identifier, a series of alphanumeric characters assigned and unique to an online article. The DOI is typically found at the first page of the online journal article.

10.14.b. Pattern **10.14.b.**

AUTHOR, A.A.A. (Year when the article was published). Article title in sentence case. Title of the journal, volume number if available (issue number), inclusive pages. doi:

10.14.c. Example **10.14.c.**

GRANT, R.H. (1997). Partitioning of biologically active radiation in plant canopies. International Journal of Biometeorology, 40(1), 26-40. doi: 10.1007/BF02439408

Section 10.15. Journal Article (Electronic without DOI)

10.15.a. Pattern **10.15.a.**

AUTHOR, A.A.A. (Year when the article was published). Article title in sentence case. Title of the journal, volume number if available (issue number), inclusive pages. Retrieved Month Day, Year from full internet address

10.15.b. Example **10.15.b.**

RAÑOLA, R.F. JR., DEMAFELIS, R.B., DEL ROSARIO, E., & BATALLER, B.G. (2009). Enhancing the viability of cassava feedstock for bioethanol in the Philippines. ISSAAS Journal, 15(2), 147-158. Retrieved January 31, 2011 from http://www.issaas.org/journal/v15/02/journal-issaas-v15n2-13-ranola-et_al.pdf

Section 10.16. Magazine Article

10.16.a. Pattern **10.16.a.**

AUTHOR, A.A.A. (Year, Month and day if available). Article title in sentence case. Title of the magazine, volume number if available (issue number), inclusive pages.

10.16.b. Example **10.16.b.**

ELEPAÑO, A.R. & GRATUITO, M.K.B. (2003, October). Renewable energy-based drying systems in the Philippines. Agriculture, 7(10), 10-12.

Section 10.17. Newspaper Article

10.17.a. Pattern **10.17.a.**

AUTHOR, A.A.A. (Year, Month and day). Article title in sentence case. Name of the newspaper, p./pp. inclusive pages.

10.17.b. Example **10.17.b.**

GIRON, A. (2011, April 13). Cavite set on building central agri market to rival Divisoria. Manila Bulletin, p. 13.

Section 10.18. Magazine or Newspaper Article (Electronic)

10.18.a. Pattern **10.18.a.**

AUTHOR, A.A.A. (Year, Month and day if available). Article title in sentence case. Title of the magazine, volume number if available (issue number), inclusive pages. Retrieved Month Day, Year from full internet address

10.18.b. Pattern **10.18.b.**

AUTHOR, A.A.A. (Year, Month and day). Article title in sentence case. Name of the newspaper, p./pp. inclusive pages. Retrieved Month Day, Year from full internet address

10.18.c. Example **10.18.c.**

GOYAL, S. (2011, April-May). Bioenergy: Impediments and plausible solutions. AltEnergy eMagazine. Retrieved April 25, 2011 from http://www.altenergymag.com/emagazine/2011/04/bioenergy-impediments-and-plausible-solutions/1701

Section 10.19. Conference Paper (Published Proceedings)

10.19.a. Pattern **10.19.a.**

AUTHOR, A.A.A. (Year, Month of publication). Title of paper in sentence case. Paper presented at Title of published proceedings. Place of Publication: Publisher.

10.19.b. Example **10.19.b.**

BADILLA, D.B., GOSTOMSKI, P.A. & DALIDA, M.L.P. (2010, September). Biofiltration for indoor air pollution control. Paper presented at 5th Engineering Research and Development for Technology (ERDT) Conference. Manila: ERDT Consortium.

Section 10.20. Conference Paper (Unpublished Proceedings)

10.20.a. Pattern **10.20.a.**

AUTHOR, A.A.A. (Year, Month and day of paper presentation). Title of paper in sentence case. Paper presented at Title of conference/ symposium/ meeting/ convention, Location of the conference.

10.20.b. Example **10.20.b.**

ZUBIA, O.F., PARAS, F.O., GALLEGOS, R.K.B., RESURRECCION, A.N., RAFOSALA, B.C. & CATUBIG, J.C.M. (2010, April 22). Pneumatic fertilizer distribution. Paper presented at 60th PSAE Annual National Convention, Benguet State University, La Trinidad, Benguet.

Section 10.21. Thesis, Dissertation, Field Practice or Special Problem Manuscript

10.21.a. Pattern **10.21.a.**

AUTHOR, A.A.A. (Year of thesis submission). Title of thesis in sentence case. Unpublished undergraduate thesis or Unpublished master's thesis or Unpublished doctoral dissertation or Unpublished undergraduate field practice report or Unpublished undergraduate special problem report– Degree. University or Institution, Location of the Institution.

10.21.b. Example **10.21.b.**

BADAYOS, N.G. (2003). Single line voltage (10V-15V) fault location through difference surge pattern identification. Unpublished undergraduate thesis – Electrical Engineering. University of the Philippines, Los Baños, College, Laguna.

10.21.c. Example **10.21.c.**

MARIANO, L.A. (2007). Productivity improvement at the surface treatment division of Nidec Copal Philippine Corporation, Cabuyao, Laguna. Unpublished undergraduate field practice report – Industrial Engineering. University of the Philippines, Los Baños, College, Laguna.

10.21.d. Example **10.21.d.**

AMONGO, R.M.C. (1995). Treatment and disposal of nata de coco wastewater. Unpublished master's thesis - Agricultural Engineering. University of the Philippines Los Baños, College, Laguna.

10.21.e. Example **10.21.e.**

ELAURIA, J.C. (1993). Optimization of fluidized bed combustion of Semirara coal. Unpublished doctoral dissertation - Mechanical Engineering. University of the Philippines Diliman, Diliman, Quezon City.

Section 10.22. Technical Reports or Papers

10.22.a. Pattern **10.22.a.**

AUTHOR, A.A.A. (Year of report submission). Title of report in sentence case. Unpublished technical report – course or subject. University or Institution, Location of the Institution.

10.22.b. Example **10.22.b.**

GALLEGOS, R.K.B. (2011). Energy analysis of cassava bioethanol production in the Philippines. Unpublished technical paper – AENG 266. University of the Philippines Los Baños, College, Laguna.

Section 10.23. Brochure

10.23.a. Pattern **10.23.a.**

AUTHOR, A.A.A. (Year). Title of brochure [Brochure]. Place: Use "Author" as publisher.

10.23.b. Example **10.23.b.**

AMD-IAE. (2011). Agricultural machinery division [Brochure]. CEAT, UPLB, College, Laguna: Author.

Section 10.24. Lecture Notes (Print and Presentation)

10.24.a. Pattern **10.24.a.**

AUTHOR, A.A.A. (Year of publication). Title of lecture in sentence case [Handouts or Powerpoint slides if applicable]. University or Institution, Location of the Institution.

10.24.b. Example **10.24.b.**

SALUDES, R.B. (2010). Solar radiation interaction with plants [Powerpoint slides]. AFSD-IAE, CEAT, UPLB, College, Laguna.

Section 10.25. Lecture Notes (Online)

10.25.a. Pattern **10.25.a.**

AUTHOR, A.A.A. (Year of publication). Title of lecture in sentence case. Retrieved Month Day, Year from full internet address

10.25.b. Example **10.25.b.**

VENKATESHAN, S.P. (2010). Introduction to pressure measurement. Retrieved April 16, 2010 from http://nptel.iitm.ac.in/courses/IIT-MADRAS/Mechanical_Measurements_Metrology/index.php

Article 11

In-Text Citation

Section 11.1. General Content

11.1.a. In general, paraphrased in-text citations shall contain the author's surname and the year of publication. The page number shall be included when presenting a direct quotation.

11.1.b. More specific formats for different cases are prescribed in the subsequent sections.

Section 11.2. Works with One Author

11.2.a. Example **11.2.a.**

> . . . its transportation or use (Brown, 2003).

11.2.b. Example **11.2.b.**

> Ohmura (1982) pointed out . . .

Section 11.3. Works with Two Authors

11.3.a. If the authors are mentioned as part of the sentence, they should be joined by the word 'and' (see Example **11.3.b.**). If the citation is enclosed in parentheses, the two authors should be joined with an ampersand (&), as shown in Example **11.3.c.**.

11.3.b. Example **11.3.b.**

> Dufie and Beckman (1980) suggested . . .

11.3.c. Example **11.3.c.**

> Earlier investigations (Ibanez & Perez, 1980) revealed that . . .

Section 11.4. Works with Three or More Authors

11.4.a. For works with three or more authors, only the first author's surname shall appear and shall be followed by the phrase "et al."

11.4.b. Example **11.4.b.**

. . . excellent sources of energy in remote areas (Althouse et al., 1996).

11.4.c. Example **11.4.c.**

Acra et al. (1990) measured . . .

Section 11.5. Works with No Author

11.5.a. When the work has no author, the first two or three words of the book or article title shall be cited, followed by the year or "n.d." for undated references.

11.5.b. Example **11.5.b.**

. . . is defined as . . . (Grolier Dictionary, 1992).

Section 11.6. Undated Works

11.6.a. Example **11.6.a.**

. . . manufacture of renewable energy systems and components (Elauria, n.d.).

11.6.b. Example **11.6.b.**

Sen (n.d.) presented a method . . .

Section 11.7. Multiple Works in the Same Sentence

11.7.a. When the multiple works are cited in the same sentence or paragraph, the author names and dates shall be separated by semicolon.

11.7.b. Example **11.7.b.**

Bowen ratio estimation have been conducted in various locations like lakes, grass canopies, forests and agricultural sites (Rohli, 2004; Ibanez & Perez, 1998; Kakane & Agyei, 2006; Todd et al., 2000).

Section 11.8. Group or Institution as Author

11.8.a. When the institution is commonly known by an acronym, the full name of the institution is written out when presented for the first time in the text. The full name shall be followed by its acronym in square bracket. In subsequent citations, the acronym shall suffice, followed by the year of publication.

11.8.b. Example **11.8.b.**

First mention

In the Philippines, duck ranks second to chicken in economic importance as a source of egg and meat (Bureau of Agricultural Statistics [BAS], 2007).

Second mention

The duck population is distributed in different provinces in the country where the top five regional producers include Regions III, VI, II, XII and IV (BAS, 2007).

11.8.c. For institutions not commonly represented by acronyms, the whole name shall be presented followed by the year of publication.

11.8.d. Example **11.8.d.**

Lascar Electronics (2010) claimed that . . .

11.8.e. Example **11.8.e.**

. . . can be used for different solar applications (Solar Server, 2010).

Section 11.9. Works Discovered in Another Work [1]

11.9.a. Example **11.9.a.**

Lundy (1969), cited by Espinas (1981), reported that the . . .

11.9.b. Example **11.9.b.**

. . . the equation for heat production of an embryo (Schmidt-Nielsen, 1975, cited by French, 1997).

Section 11.10. Personal Communication

11.10.a. Personal communication shall not be included in the reference list and this format shall appear in text only.

11.10.b. Example **11.10.b.**

. . . the performance of the multi-crop dryer (E.P. Lozada, personal communication, January 21, 2007).

11.10.c. Example **11.10.c.**

M. G. Villano (personal communication, August 5, 2009) explained the possible effects . . .

Section 11.11. Direct Quotations in the Text

11.11.a. The cases and examples contained in the previous sections apply to paraphrased texts. For direct quotations, Sections 11.1 to 11.10 still apply but the page number where the quotation was lifted from shall be included.

11.11.b. Example **11.11.b.**

De la Cruz (2010) found that " there is no significant difference . . ." (p. 29).

11.11.c. Example **11.11.c.**

. . ."the amount of water, on, under or above the earth's surface . . ." (Leap, 1999, p. 3).

[1] Although citing a work discovered in another work is permitted, this practice should be used sparingly. It is preferred that the original work is used and cited.

Article 12

Presentation of Quantities, Units and Dimensions

Section 12.1. Adoption of SI Units of Measure

12.1.a. Authors are strongly encouraged to use the SI system of units in their manuscripts, although the English system may still be used in justifiable cases.

12.1.b. All SI units that are used in thesis, field practice and special problem manuscripts shall be presented according to their correct representations stated in subsequent sections.

12.1.c. The guidelines included in this article were adopted (almost verbatim) from Philippine Agricultural Engineering Standards (PAES) 010:2005 and 020:2005.

Section 12.2. SI Base and Supplementary Units and their Symbols

The following table contains the base and supplementary units in SI and their corresponding symbols. Such units shall be used properly in the manuscript.

	Quantity	Unit	Symbol of SI Unit
Base Units:			
1	length	meter	m
2	mass	kilogram	kg
3	time	second	s
4	electric current	ampere	A
5	thermodynamic temperature	kelvin	K
6	amount of substance	mole	mol
7	luminous intensity	candela	cd
Supplementary units:			
1	plane angle	radian	rad
2	solid angle	steradian	sr

Section 12.3. SI Unit Prefixes, Symbols, and their Multiples and Submultiples

The following table contains the prefixes and symbols of units in SI and their corresponding multiples and submultiples. Such prefixes and symbols shall be used properly in the manuscript.

Prefix	SI Symbol	Multiples and Submultiples	Meaning (No. of times multiplied)
exa*	E	10^{18}	1 000 000 000 000 000 000
peta*	P	10^{15}	1 000 000 000 000 000
tera*	T	10^{12}	1 000 000 000 000
giga	G	10^{9}	1 000 000 000
mega	M	10^{6}	1 000 000
kilo	k	10^{3}	1 000
hecto**	h	10^{2}	100
deca**	da	10^{1}	10
deci**	d	10^{-1}	0.1
centi	c	10^{-2}	0.01
milli	m	10^{-3}	0.001
micro	μ	10^{-6}	0.000 001
nano*	n	10^{-9}	0.000 000 001
pico*	p	10^{-12}	0.000 000 000 001
femto*	f	10^{-15}	0.000 000 000 000 001
atto*	a	10^{-18}	0.000 000 000 000 000 001

*Rarely used, mostly in highly scientific work
**Not preferred

Section 12.4. Derived Units

Derived units are combinations of basic units or other derived units as needed to describe physical quantities. The following table contains some common derived units in SI and their corresponding formulas. Such units shall be used properly in the manuscript.

Quantity	Unit	SI Symbol	Formula
acceleration	meter per second squared	-	m/s^2
Activity (of a radioactive source)	disintegration per second	-	(disintegration)/s
Angular acceleration	radian per second squared	-	rad/s^2
Angular velocity	radian per second	-	rad/s
Area	square meter	-	m^2
Density	kilogram per cubic meter	-	kg/m^3
electrical capacitance	farad	F	A·s/V
electrical conductance	siemens	S	A/V
electrical field strength	volt per meter	-	V/m
electrical inductance	henry	H	V·s/A

Continued on next page

Quantity	Unit	SI Symbol	Formula
electrical potential difference	volt	V	W/A
electrical resistance	ohm	Ω	V/A
electromotive force	volt	V	W/A
energy	joule	J	N.m
Entropy	joule per kelvin	-	J/K
Force	newton	N	kg·m/s^2
frequency	hertz	Hz	(cycle)/s
illuminance	lux	lx	lm/m^2
luminance	candela per square meter	-	cd/m^2
luminous flux	lumen	lm	cd·sr
magnetic field strength	ampere per meter	-	A/m
magnetic flux	weber	Wb	V·s
magnetic flux density	tesla	T	Wb/m^2
magnetomotive force	ampere	A	-
Power	watt	W	J/s
Pressure	pascal	Pa	N/m^2
quantity of electricity	coulomb	C	A·s
quantity of heat	joule	J	N·m
radiant intensity	watt per steradian	-	W/sr
specific heat	joule per kilogram-kelvin	-	J/kg·K
Stress	pascal	Pa	N/m^2
thermal conductivity	watt per meter-kelvin	-	W/m·K
Velocity	meter per second	-	m/s
viscosity, dynamic	pascal-second	-	Pa·s
viscosity, kinematic	square meter per second	-	m2/s
voltage	volt	V	W/A
volume	cubic meter	-	m^2
wavenumber	reciprocal meter		(wave)/m
Work	joule	J	N·m

Section 12.5. Application of Prefixes

12.5.a. The prefixes shall be used to indicate orders of magnitude, thus eliminating insignificant digits and decimals, and providing a convenient substitute for writing powers of 10 as generally preferred in computation.

12.5.b. Example **12.5.b.**

12 300 m	**OR**	12.3×10^3 m	**BECOMES**	12.3 km
15 100 g	**OR**	15.1×10^3 g	**BECOMES**	15.1 kg
0.020 L	**OR**	20.0×10^{-3} L	**BECOMES**	20 mL
0.0123 mA	**OR**	12.3×10^{-6} A	**BECOMES**	12.3 μA

12.5.c. The prefix is not separated but combined with the parent unit (root word) to form one word.

12.5.d. Example **12.5.d.**

centimeter	**NOT**	centi meter	**NOR**	centi-meter
kilogram	**NOT**	kilo gram	**NOR**	kilo-gram
milliliter	**NOT**	milli liter	**NOR**	milli-liter

12.5.e. Not more than one prefix shall be included in any unit. Double prefixes and hyphenated prefixes shall not be used.

12.5.f. Example **12.5.f.**

nanometer (nm)	**NOT**	millimicrometer (mμm)
millimeter per second (mm/s)	**NOT**	meter per millisecond (mm/μs)

12.5.g. When a unit is expressed in the form of a product or quotient, the prefixed unit, if any, should be the first occurring unit.

12.5.h. Example **12.5.h.**

millinewton meter (mN · m)	**NOT**	Newton millimeter (N · mm)
millimeter per second (mm/s)	**NOT**	meter per millisecond (m/ms)

12.5.i. The only base unit that contains a prefix is the kilogram. Multiples and submultiples of a derived unit containing kilogram are formed by addition of prefixes to the term "gram". If kilogram is not the first term, then two prefixes may appear in the derived units.

12.5.j. Example **12.5.j.**

kg/m^3	**AND HENCE**	g/m^3	**AND**	mg/m^3
J/kg	**AND HENCE**	kJ/kg	**AND**	MJ/kg

12.5.k. As much as possible, prefixes shall not be used in the denominator except for kilogram which is a base unit.

12.5.l. Example **12.5.l.**

Correct Symbols	**Not Correct**
50 000 J/s	50 J/ms
25 000 m/s	25 N/ms

12.5.m. With SI units of higher order such as m^2 or m^3 , the prefix is also raised to the same order.

12.5.n. Example **12.5.n.**

	Correct Symbols
square millimeter	mm^2 $(10^{-3}\ m)^2$ $10^{-2}\ m^2$
cubic milliliter	mL^3 $(10^{-3}\ L)^3$ $10^{-9}\ m^3$

Section 12.6. Selection of Appropriate Units and Prefixes

12.6.a. When expressing a quantity by a numerical value and a unit, a prefix should be chosen so that the numerical value preferably lies between 0.1 and 1000, except where certain multiples and submultiples have been agreed for particular use. The same unit, multiple or submultiple should be used in tables even though the series may exceed the preferred range of 0.1 to 1000.

12.6.b. Example **12.6.b.**

Correct Symbols	**Incorrect Symbols**
8.613 m	0.008 613 km
861.3 km	861 300.0 m
500 kPa or 0.5 MPa	500 000 Pa

Section 12.7. Capitalization

12.7.a. All unit symbols are written in lower case (small) letters except for SI units derived from a proper name. The following table summarizes the symbols for units derived from proper names.

Units derived from proper name	Symbols
watt	W
volt	V
newton	N
pascal	Pa
coulomb	C
farad	F
siemens	S
weber	Wb
tesla	T
henry	H
becquerel	Bq
degree Celsius	°C
joule	J
hertz	Hz
ampere	A

12.7.b. The “liter” symbol shall be capitalized (L) to avoid confusion with other symbols or numbers like “Figure 1”.

12.7.c. Unabbreviated units are not capitalized; for example kelvin, joule, newton, etc. except for Celsius which is always written with a capital C.

12.7.d. Numerical prefixes and their symbols are not capitalized; except for the symbols M (mega), G (giga), T (tera), P (peta) and E (exa).

Section 12.8. Singular and Plural Form

12.8.a. Unabbreviated SI units form their plurals in the usual manner by adding s at the end of the word. Exceptions are “siemens”, “hertz” and “lux” which stand for both singular and plural form. SI symbols are always written in singular form.

12.8.b. Example **12.8.b.**

	Correct Symbol	**Not Correct**
50 newtons	50 N	50 Ns
25 millimeters	25 mm	25 mms
4 grams	4 g	4 gs
15 kilometers	15 km	15 kms

Section 12.9. Punctuation

12.9.a. A symbol is not an abbreviation of the name of the unit or quantity; therefore periods shall not be used after any SI unit symbol, unless the symbol occurs at the end of a sentence.

12.9.b. Example **12.9.b.**

3 kg	**NOT**	3 kg.
m^2	**NOT**	$m.^2$

12.9.c. No abbreviation shall be used in SI.

12.9.d. Example **12.9.d.**

For Unit:	**Use this Symbol**	**Not the Abbreviation**
cubic meter	m^3	cu.m ; cu m
gram	g	gm. ; gm
minute	min	min.

12.9.e. When symbols are used in an adjectival sense, a hyphen may or may not be used between the symbol and the number.

12.9.f. Example **12.9.f.**

	Correct (hyphen may/ may not be used)	**Not Correct**
16 mm film	16-mm film	16 mm-film
3 tonne truck	3 tonne truck	3 tonne-truck

Section 12.10. Spacing

12.10.a. Unit names and symbols are separated from the numerical value by a space, except in the case of degree (°), minute (’) and second (") ; e.g. 37°C and 28°50’24".

12.10.b. Example **12.10.b.**

21 km	**NOT**	21km
15 kg	**NOT**	5kg

12.10.c. A space shall be provided between the numbers and signs for multiplications, division, addition and subtraction.

12.10.d. Example **12.10.d.**

4 m × 3 m	**NOT**	4 m× 3m
6 mm – 3 mm	**NOT**	6 mm –3 mm
5 cm + 4 cm	**NOT**	5 cm +4 mm

Section 12.11. Spelling

12.11.a. Since SI is the international language of measurement, it is advisable to adhere as closely and promptly as possible to the SI rules of usage for better word understanding.

12.11.b. The following international spellings of SI units are much preferred: “metre”, “tonne” and “litre” but “meter”, “ton” and liter are permissible.

12.11.c. When referring to the instrument or device and for the verb form, the spelling “meter” is to be used as in “speedometer”, “electric meter”, “taxi meter” and “metered”.

Section 12.12. Derived Units

12.12.a. The product of two or more units in symbolic form is preferably indicated by a dot midway in relation to unit symbol height. The dot may be dispensed with when there is no risk of confusion with another unit symbol.

12.12.b. Example **12.12.b.**

100 N·m	**OR**	100 Nm	**NOT**	100 mN
1 V·s	**OR**	1 V s	**NOT**	1 sV
100 kW·h	**OR**	100 kWh	**NOT**	100 hkW

12.12.c. A solidus (oblique stroke, /), a horizontal line or negative powers may be used to express a derived unit formed from two others by division.

12.12.d. Example **12.12.d.**

	Correct
15 meters per second	$15\ m/s$ $15\ \frac{m}{s}$ $15\ m \cdot s^{-1}$
35 newtons per square meter	$35\ N/m^2$ $35\ \frac{N}{m^2}$ $35\ N \cdot m^{-2}$

12.12.e. Names and symbols are not to be mixed within the same unit expression. For consistency, wither all words in the metric name or description, or all symbols should be used.

12.12.f. Example **12.12.f.**

Correct	**Incorrect**
9 meters per second	9 m per s
9 m/s	9 m per second
	9 meter per s
	9 meter/second
10 joules per second	10 J per s
10 J/s	10 J per second
	10 joules per s
	10 joules/second

Section 12.13. Use of Decimals

12.13.a. Whenever a numerical value is less than one, a zero shall precede the decimal point.

12.13.b. Example **12.13.b.**

Correct	**Incorrect**
0.7 mL	.7 mL
0.1 kg	.1 kg

12.13.c. Decimals should be used as much as possible instead of common fractions, which should be avoided. Decimals are also preferred for computer applications as common fractions introduce complications in key punching and programming.

12.13.d. Example **12.13.d.**

Correct	**Not Preferred**
0.75 L	3/4 L
1.5 m	1 1/2 m

Section 12.14. Grouping of Numbers

12.14.a. In SI, to facilitate reading, numbers which have four or more digits shall be arranged in groups of three, separated by a space instead of comma, counting from the decimal position or marker with a space or gap between groups. This is to avoid confusion since some European countries use the comma as decimal marker.

12.14.b. Example **12.14.b.**

Correct	**Incorrect**
983 769.816 34	986 769.81634
1 532	1,532

12.14.c. In the Philippines, the use of comma as thousand separator or marker is allowed.

12.14.d. Example **12.14.d.**

Correct:

9,494 m
10,666.25 L

Section 12.15. Non-SI Units

12.15.a. Certain units outside the SI are recognized by ISO because of their practical importance in specialized fields. Recognized names for some multiples of units such as “liter” (L) for volume, “hectare” (ha) for land measure and “metric ton” (t) for mass.

12.15.b. The SI base unit for thermodynamic temperature is kelvin (K). Because of the wide usage of the degree Celsius, particularly in engineering and nonscientific areas, the Celsius scale (formerly called the centigrade scale) may be used when expressing temperature.

12.15.c. The SI unit for time is the second. This unit is preferred and should be used when technical calculations are involved. In other cases use of the minute (min), hour (h), day (d), etc., is permissible.

12.15.d. The SI unit for plane angle is the radian. The use of arc degrees (°) and its decimal or minute (’), second (") submultiple is permissible when the radian is not a convenient unit. Solid angles should be expressed in steradians.

Section 12.16. Preferred Units and Conversion Factors

Preferred units for expressing physical quantities are presented as an aid in selecting proper units for given applications and to promote consistency where interpretation of the general rules of SI may not produce consistent results. For the preferred units and conversion factors, PAES 020:2005 (Metrication Guidelines) should be consulted.

Section 12.17. Representation of Numbers and Numerical Values

12.17.a. For clarity, the symbol x rather than a point shall be used to indicate multiplication of numbers and numerical values.

12.17.b. Example **12.17.b.**

Write 1.8×10^{-3} (**not** $1.8.10^{-3}$ or $1.8 \cdot 10^{-3}$)

12.17.c. To express numbers of items (as opposed to numerical values of physical quantities), the numerals one to nine shall as a general rule be spelt out in full.

12.17.d. Example **12.17.d.**

“Carry out the test on five tubes, each 5 m long.”

12.17.e. Example **12.17.e.**

“Select further 15 tubes, each 5 m long.”

Section 12.18. Indication of Dimensions and Tolerances

12.18.a. Dimensions and tolerances shall be indicated in an unambiguous manner.

12.18.b. Example **12.18.b.**

80 mm $\times$ 25 mm $\times$ 50 mm (**not** 80 $\times$ 25 $\times$ 50 mm)

12.18.c. Example **12.18.c.**

80 μF $\pm$ 2 μF or (80 $\pm$ 2) μF

12.18.d. Example **12.18.d.**

10 kPa to 12 kPa (**not** 10 to 12 kPa)

12.18.e. Example **12.18.e.**

0 °C to 10 °C (**not** 0 to 10 °C)

12.18.f. In order to avoid misunderstanding, tolerances on percentages shall be expressed in a mathematically correct form.

12.18.g. Example **12.18.g.**

Write "from 63 % to 67 %" to express a range.

12.18.h. Example **12.18.h.**

Write "(65 ± 2) %" to express a center value with tolerance. The form "65 ± 2 %" shall not be used.

Section 12.19. Additional Guidelines

12.19.a. Internationally standardized unit symbols shall not be modified by adding subscripts or other information.

12.19.b. Example **12.19.b.**

"U_{max} = 500 V" and **not** "U = 500 V_{max}"

" a mass fraction of 5 % and **not** "5 % (m/m)"

"a volume fraction of 7 %" and **not** "7 % (V/V)"

(Remember that % = 0.01 and $‰$ = 0.001 are "pure" numbers.)

12.19.c. Do not mix information with unit symbols, Write, for example, "the water content is 20 mL/kg" and **not** "20 mL H_2O/kg" or "20 mL of water/kg".

12.19.d. Quotient quantities shall not contain the word "unit" in the denominator. For example, write "mass per length" and **not** "mass per unit length".

12.19.e. Distinguish between an object and any quantity describing the object, e.g. between "surface" and "area", "body" and "mass", "resistor" and "resistance", "coil" and "inductance".

12.19.f. Two or more physical quantities cannot be added or subtracted unless they belong to the same category of mutually comparable quantities. Accordingly, the method of expression for a relative tolerance such as 230 V ± 5 % does not comply with this basic law of algebra. The following methods of expression may be employed instead:

"230 × (1 ± 5 %) V"

"230 × (1 ± 0.05) V"

"230 V, with a relative tolerance of ± 5 %"

Article 13

Format of Electronic Submission

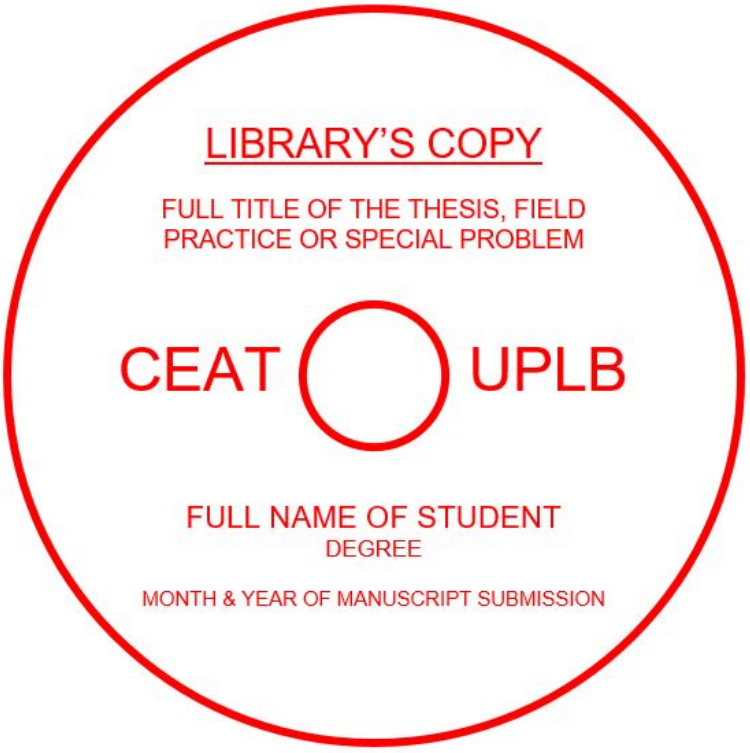
Aside from the bound copies of thesis, field practice and special problem manuscripts, divisions, departments and libraries may require the submission of such manuscripts in electronic forms. In such cases, submissions should be contained in compact discs (CD) or equivalent. The student is required to submit two (2) electronic versions of the manuscript: one (1) for the library (CEAT or University) and one (1) for the department or division where the student belongs.

Section 13.1. Content and Format of Library Submissions

13.1.a. Only the .pdf version of the manuscript shall be contained in the library submission. This .pdf version shall be password-protected by the author before saving (burning) the file to the CD. In providing password protection, the file configuration settings shall be done in a way so that only viewing and printing of the manuscript are allowed. Editing, copying portions of the manuscript or modifying the file in any way shall not be allowed in the final version of the file.

13.1.b. Preferably, CD copies for library submission should be labelled with "LIBRARY'S COPY", formatted according to the pattern shown in Pattern **13.1.c.**

13.1.c. Pattern **13.1.c.**



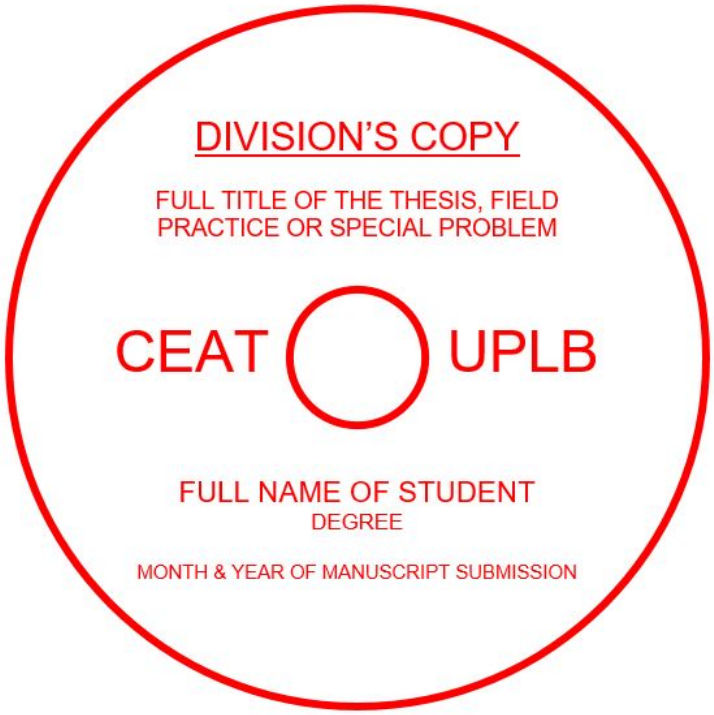
13.1.d. Example **13.1.d.**

Section 13.2. Contents and Format of Department or Division Submissions

13.2.a. For submissions to departments or divisions, the files may include, but not limited to, MS Word (or equivalent editable file) and .pdf copies of the manuscripts, posters, spread sheet entries of data, etc. The .pdf copy of the manuscript in this submission may be unrestricted (without password).

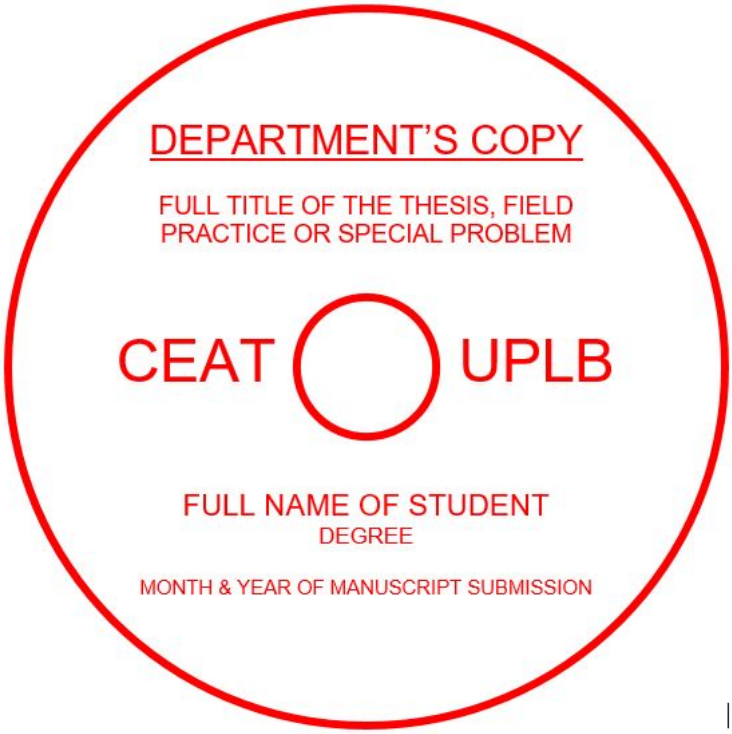
13.2.b. For BSABE students, CD copies for division submissions should be labelled with "DIVISION'S COPY", formatted according to the pattern shown in Pattern **13.2.c.** Likewise, for non-BSABE students, CD copies for department submissions should be labelled with "DEPARTMENT'S COPY", formatted according to the pattern shown in Pattern **13.2.e.**

13.2.c. Pattern **13.2.c.**

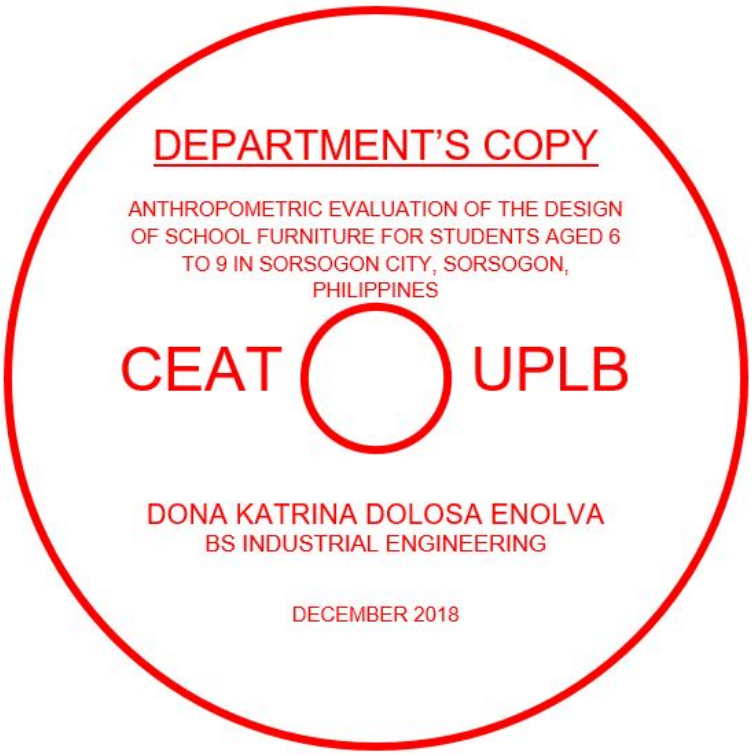


13.2.d. Example **13.2.d.**

13.2.e. Pattern **13.2.e.**



13.2.f. Example **13.2.f.**



Article 14

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