

**NATIONAL UNIVERSITY**

Manila

**<Title of Capstone Design Project>**

A Capstone Design Project  
presented to the Faculty of <Program>

In partial fulfillment of the requirements  
for the conferral of the degree  
of Bachelor of Science in <Program>

<Name of Proponent 1>

<Name of Proponent 2>

<Name of Proponent n>

<Month and year of completion>

## APPROVAL SHEET

In partial fulfillment of the requirements for the conferral of the degree of Bachelor of Science in <Program>, this Capstone Design Project entitled “<Title of Capstone Design Project>”, prepared and submitted by <Name of Proponent 1>, <Name of Proponent 2> and <Name of Proponent n> is hereby recommended for final oral examination.

---

<Full name of Adviser>  
Adviser

Approved by the Panel for Oral Examination with a grade of \_\_\_\_\_.

---

<Name of panel member 1>  
Panelist

---

<Name of panel member 2>  
Panelist

---

<Name of panel member 3>  
Panelist

Accepted as partial fulfillment of the requirements for the conferral of the degree of Bachelor of Science in <Program>.

---

**Engr. Alexa Ray Fernando, M.Eng.**  
Dean, College of Engineering

Date: <Month and year of Completion>

## **ABSTRACT**

An abstract summarizes, usually in one paragraph of 300 words or less, the major aspects of the entire paper in a prescribed sequence that includes: 1) the overall purpose of the study and the research problem(s) you investigated; 2) the basic design of the study; 3) major findings or trends found as a result of your analysis; and, 4) a brief summary of your interpretations and conclusions (USC Libraries, 2020). Limit your abstract to one page only.

## DEDICATION

This is your way to give honor to the people who may have helped you or inspired you finish this project in one way or another. This portion should be in personal tone. Limit your dedication to one page only.

## **ACKNOWLEDGMENT**

This is a statement of your indebtedness to people or organization in any/all stage/s of this study. This portion should be in personal tone. Limit your dedication to one page only.

## TABLE OF CONTENTS

<b>TITLE PAGE .....</b>	<b>i</b>
<b>APPROVAL SHEET .....</b>	<b>ii</b>
<b>ABSTRACT .....</b>	<b>iii</b>
<b>DEDICATION.....</b>	<b>iv</b>
<b>ACKNOWLEDGMENT .....</b>	<b>v</b>
<b>TABLE OF CONTENTS .....</b>	<b>vi</b>
<b>LIST OF TABLES.....</b>	<b>vii</b>
<b>LIST OF FIGURES .....</b>	<b>viii</b>
<b>LIST OF APPENDICES .....</b>	<b>ix</b>
<b>CHAPTER 1: THE PROBLEM AND ITS BACKGROUND .....</b>	<b>1</b>
1.1 INTRODUCTION.....	1
1.2 OBJECTIVE OF THE PROJECT .....	1
1.3 SIGNIFICANCE OF THE PROJECT .....	1
1.4 SCOPE AND LIMITATION OF THE PROJECT.....	1
1.5 DEFINITION OF TERMS.....	2
<b>CHAPTER 2: LITERATURE REVIEW AND FRAMEWORK OF THE PROJECT .....</b>	<b>3</b>
2.1 INTRODUCTION TO LITERATURE REVIEW .....	3
2.1.1 Feel free to add subsection as needed (delete otherwise).....	3
2.2 RESULT OF LITERATURE REVIEW.....	3
2.2.1 Feel free to add subsection as needed (delete otherwise).....	3
2.3 CONCLUSION AND FRAMEWORK OF THE PROJECT .....	3
<b>CHAPTER 3: PROJECT DESIGN AND METHODOLOGY .....</b>	<b>5</b>
3.1 PROJECT DESIGN .....	5
3.1.1 Industry Standards Used .....	5
3.1.2 Design Constraints .....	5
3.1.3 Design Tradeoffs .....	5
3.1.4 Feel free to add subsection as needed (delete otherwise).....	6
3.2 PROJECT DEVELOPMENT AND IMPLEMENTATION .....	6
3.2.1 Feel free to add subsection as needed (delete otherwise).....	6
3.3 PROJECT TESTING AND EVALUATION.....	7
3.3.1 Feel free to add subsection as needed (delete otherwise).....	7
3.4 FEEL FREE TO ADD SUBSECTION AS NEEDED (DELETE OTHERWISE).....	7
<b>CHAPTER 4: RESULTS AND DISCUSSION .....</b>	<b>8</b>
4.1 FEEL FREE TO ADD SUBSECTION AS NEEDED (DELETE OTHERWISE).....	8
4.2 FEEL FREE TO ADD SUBSECTION AS NEEDED (DELETE OTHERWISE).....	8
<b>CHAPTER 5: SUMMARY, CONCLUSION AND RECOMMENDATION.....</b>	<b>9</b>
5.1 SUMMARY .....	9
5.2 CONCLUSION .....	9
5.3 RECOMMENDATION .....	9
<b>LIST OF REFERENCES.....</b>	<b>10</b>
<b>APPENDICES.....</b>	<b>11</b>
<b>CURRICULUM VITAE .....</b>	<b>16</b>

## LIST OF TABLES

Table 1. Sample Table Caption.....	8
------------------------------------	---

LIST OF FIGURES

Figure 1. Sample Figure Caption .....4



## LIST OF APPENDICES

Appendix 1. Extended Abstract Paper .....	11
Appendix 2. Author Declaration Form .....	14
Appendix 3. Feel free to add appendix as needed (delete otherwise) .....	15

## **CHAPTER 1: THE PROBLEM AND ITS BACKGROUND**

### **1.1 Introduction**

The introduction leads the reader from a general subject area to a particular topic of inquiry. It establishes the scope, context, and significance of the research being conducted by summarizing current understanding and background information about the topic, stating the purpose of the work in the form of the research problem supported by a hypothesis or a set of questions, explaining briefly the methodological approach used to examine the research problem, highlighting the potential outcomes your study can reveal, and outlining the remaining structure and organization of the paper (USC Libraries, 2020).

### **1.2 Objective of the Project**

Objectives of the project describe what the proponents are trying to achieve. Objectives can be classified into general and specific objectives to give the reader a better understanding of what will be done during the project

### **1.3 Significance of the Project**

This section explains the contribution of the project to possible users and readers. This explains why such project is needed to be done.

### **1.4 Scope and Limitation of the Project**

The scope and limitations of the study are those characteristics of design or methodology that impacted or influenced the interpretation of the findings from your research/project (USC Libraries). This is where you enumerate and explain what the study only covers and the reasons why your study needs to be limited to certain extent only.

## **1.5 Definition of Terms**

This section lists down terms that are operationally defined and used in this project. This includes specific terms used that may have additional or another meaning from the common definition.

## **CHAPTER 2: LITERATURE REVIEW AND FRAMEWORK OF THE PROJECT**

### **2.1 Introduction to Literature Review**

Introduction to literature review gives the reader an overview of the overall project topic. It also breaks down the overall topic to the essential specific topics that are needed to be reviewed and presented. It can also include topics that could be expected by the reader but were excluded and were not reviewed in the project. Types of sources used in the review are also discussed here.

#### **2.1.1 Feel free to add subsection as needed (delete otherwise)**

### **2.2 Result of Literature Review**

Literature review is not a collection of the original sources or just simply listing them down. It is a process of gathering and analyzing the identified sources and presenting the synthesis. The result of literature review is a summarized and synthesized set of information gathered from the identified sources. There are a number of types of literature review that you can use but the basic structure of presenting the result of literature review is: (1) identifying the topic/issue; (2) presentation and discussion of each searched literature; and (3) interpretation of how the literature supports the intended objective/purpose of the project. If done properly, the literature review should easily translate to the framework of the study/project.

#### **2.2.1 Feel free to add subsection as needed (delete otherwise)**

### **2.3 Conclusion and Framework of the Project**

This is where you conclude your literature review focusing on the central theories, concepts, or ideas that you were able to acquire to support your project. The conclusion is the basis for crafting the framework of project. The framework of the project should be able to present the whole

picture of study, from variables/components, their connections and make predictions or expected result based on gathered existing knowledge, observations, and ideas.



Figure 1. Sample Figure Caption

## **CHAPTER 3: PROJECT DESIGN AND METHODOLOGY**

### **3.1 Project Design**

Project design is the first step towards success in any project. This is where the project is described in detail and different aspects are defined such as goals, objectives, resources, constraints and tradeoffs, deliverables and timeline, testing and evaluation, budget estimates, etc.

#### **3.1.1 Industry Standards Used**

It is important for design projects and study that standards are used as basis for product or process design and implementation. Standards are published documents that establish specifications and procedures designed to ensure the reliability of the materials, products, methods, and/or services people use every day. Standards address a range of issues, including but not limited to various protocols that help ensure product functionality and compatibility, facilitate interoperability and support consumer safety and public health. (LexQ, 2018)

#### **3.1.2 Design Constraints**

Design constraints are conditions that are imposed for a certain project to be successful. Design constraints help narrow down choices from possible solutions to a problem when creating a project (Study.com). Design constraints are those limitations, hindrance, and other factors that may affect the design solution. The constraints may be in terms of limitations in hardware, software, data, operational procedures, interfaces, or any other part of the system. Design constraints can have a significant impact on the design and should be validated prior to imposing them on the solution (Friedenthal, 2015).

#### **3.1.3 Design Tradeoffs**

No design project offers perfect solution. Although design is a by-product of iterative ideation, brainstorming and pivoting, there is no such thing as perfect solution. Thus, design tradeoffs are unavoidable. Design tradeoffs are situations that involves losing one quality or aspect of something in return for gaining another quality or aspect. As Pablo Picasso said, “every positive value has its price in negative terms” (Fischer, 2018). Design tradeoffs and constraints go together and are being analyzed together. As decision is made on what constraints to impose, tradeoffs should be simultaneously looked into. Some of the common design constraints/trade-off consideration are reliability, scalability, programmability, compatibility, adaptability, availability, manufacturability and cost.

#### **3.1.4 Feel free to add subsection as needed (delete otherwise)**

### **3.2 Project Development and Implementation**

During the development phase, everything that will be needed to implement the project is arranged. Potential suppliers, laboratories, a schedule is made, materials and tools are ordered, instructions are given to the personnel and so forth. The development phase is complete when implementation is ready to start. The important point is that it must be clear what must be done in the implementation phase, by whom and when. (projectmanagement-training.net, accessed 2019)

The project takes shape during the implementation phase. This phase involves the construction of the actual project. At the end of the implementation phase, the result is evaluated according to the list of requirements that was created in the design phase. (projectmanagement-training.net, accessed 2019)

#### **3.2.1 Feel free to add subsection as needed (delete otherwise)**

### **3.3 Project Testing and Evaluation**

Project testing and evaluation involve the identification of testing method, test apparatus and equipment, step-by-step procedure of the test, data collection methods, performance evaluation, etc.

#### **3.3.1 Feel free to add subsection as needed (delete otherwise)**

#### **3.4 Feel free to add subsection as needed (delete otherwise)**



## CHAPTER 4: RESULTS AND DISCUSSION

4.1 Feel free to add subsection as needed (delete otherwise)

4.2 Feel free to add subsection as needed (delete otherwise)

Table 1. Sample Table Caption


## **CHAPTER 5: SUMMARY, CONCLUSION AND RECOMMENDATION**

### **5.1 Summary**

### **5.2 Conclusion**

### **5.3 Recommendation**

## LIST OF REFERENCES

- Larson, G. W., Ellis, D. C., & Rivers, P. C. (1984). *Essentials of chemical dependency counseling*. New York: Columbia University Press.
- Russo, A. C., & Jiang, H. J. (2006). Hospital stays among patients with diabetes, 2004 (Statistical Brief #17). Retrieved from Agency for Healthcare Research & Quality: <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb17.jsp>

## APPENDICES

### Appendix 1. Extended Abstract Paper

#### EXTENDED ABSTRACT TITLE

Author's Name and Surname<sup>1\*</sup>, Author's Name and Surname<sup>2</sup>

<sup>1</sup>Organization information that the author is committed to  
E-mail

<sup>2</sup>Organization information that the author is committed to  
E-mail

**ABSTRACT** - Abstract should be written in 200 words. Objectives, methods and findings are summarized in this section.

**Keywords:** Keywords regarding the work are stated in this section. Said section should contain maximum 5 words and separated with semi-colon.

#### 1. INTRODUCTION

Extended abstracts should be written according to underlying structure of the structured abstract and in a form that is shorter than the full text. Subtitles of the extended abstract should be composed from the sections of abstract and keywords, introduction and objective, method, findings and argument, conclusion and suggestions. Extended abstracts can contain figures, tables, formulations or images. Extended abstracts should be in a structure that explains the content of the declaration therefore the preparation phase of the said work. End of the lines should be aligned to the right and there should be no syllable segmentation. Extended abstracts should not exceed 4 pages including the references.

Current literature regarding the work subject should be examined and the differences of the said work from the past, similar works should be presented clearly in the introduction section.

#### 2. MATERIALS AND METHODS

All materials and methods that have been used in the work must be stated clearly and subtitles should be used when necessary.

##### 2.1. Subtitle

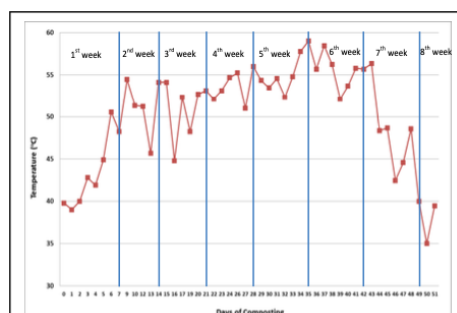
First degree titles (2.) should be written left aligned, all caps and bold. Second and 3rd degree subtitles (2.1, 2.1.1) should be written left aligned, bold and with title case. A blank line should be placed between the paragraphs and there should not be any paragraph indentation.

#### 3. RESULTS AND DISCUSSION

##### 3.1. Subtitle

All of the tables, images and figures should be centered. Figures and images should be numbered together (Figure 2) and figure definitions should be placed under the figure or image; as for the tables, they should also be numbered (Table 2) and the table header should be placed at the top of

the chart. Table, image and figure headers should be written with upper case initial letters, bold and should be centered. References (if any) of the tables, figures and images should be presented just under the tables, figures and images in the form of author surname and publication date.



**Figure 2.** Figure Header

### 3.2. Subtitle

**Table 2.** Table Header

Factor	Unit	Low	High
Final temperatures	°C	200	600
Heating rate	°C/min	1	10
Holding time	Min	0	60
N <sub>2</sub> flow rate	L/min	0.2	1.0
Condensing temperature	°C	0	10

Reference: author surname and publication date (eg: George, 2009)

## 4. CONCLUSION

Please conclude your work incorporating your most important finding as well as future works (3-4 lines).

## ACKNOWLEDGEMENT

Please acknowledge your research grant, organization, scholarship (where relevant)

## REFERENCES

Total no. of references must not exceed 15. Resources that have been presented inside [ ] in the text with numbers should be listed according to their order in the text. References that have been presented in the references list should be prepared in a format according to the reference type shown below:

If the reference is an article;

1. Pommiera, S., Chenub, D., Quintardb, M. ve Lefebvre, X., (2007). Modelling of moisture-dependent aerobic degradation of solid waste, Waste Management, 28, 7, 1188-1200

If the reference is a book;

2. Li, G., Hart, A. ve Gregory, J., (1998). Flocculation and sedimentation, 295, Technomics Press, Lancaster PA.

If the reference is a chapter of a book;

3. Blackburn, T., (1998). Flocculation and sedimentation in Li, G., Hart, A. ve Gregory, J., eds, Physical Processes, Technomics Press, 29-45, Lancaster PA.

If the reference is a declaration;

4. Yıldız, Ş., Balahorli, V., (2009). Treatment of the waste water seepage with membrane systems: Istanbul example, Membrane Technologies and Implementation Symposium, Istanbul – Turkey.

## Appendix 2. Author Declaration Form

### <Title of Extended Paper Abstract >

1. We confirm that there are no known conflicts of interest associated with this paper and there has been no significant financial support for this work that could have influenced its outcome.
2. We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but the ones listed. We further confirm that the order of authors listed in the manuscript has been approved by all of us.
3. We confirm that we have given due consideration to the protection of intellectual property associated with this work and that there are no impediments to publication, including the timing of publication, with respect to intellectual property.
4. We understand that the Corresponding Author is the sole contact for publication submission of this paper. He/she is responsible for communicating with the other authors about progress, submissions of revisions and final approval of proofs.
5. We confirm that we have provided a current, correct email address which is accessible to the Corresponding Author.

Author	e-mail Address	Signature	Date
Name of Author 1*			
Name of Author 2			
Name of Author 3			
Name of Author 4			
Name of Author 5			
Name of Author 6			
(add rows as needed)			

*\*Corresponding author who is normally the adviser/supervisor or as agreed by the group*

Appendix 3. Feel free to add appendix as needed (delete otherwise)



## CURRICULUM VITAE