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**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF**

**THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF**

**PHILOSOPHY (ENGINEERING AND TECHNOLOGY)**

**SIRINDHORN INTERNATIONAL INSTITUTE OF TECHNOLOGY**

**THAMMASAT UNIVERSITY**

**ACADEMIC YEAR 2016**

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Dissertation Advisor Associate Professor International Institute, Ph.D.

Dissertation Co-Advisor Samad Rakdee, Ph.D.

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**ABSTRACT**

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Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology, Master of Engineering Program in Information and Communication Technology for Embedded Systems, and Master of Engineering Program in Logistics and Supply Chain Systems Engineering. It also offers a Master of Science Program in Engineering and Technology and Doctor of Philosophy Program in Engineering and Technology.

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Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology, Master of Engineering Program in Information and Communication Technology for Embedded Systems, and Master of Engineering Program in Logistics and Supply Chain Systems Engineering. It also offers a Master of Science Program in Engineering and Technology and Doctor of Philosophy Program in Engineering and Technology. Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology, Master of Engineering Program in Information and Communication Technology for Embedded Systems, and Master of Engineering Program in Logistics

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(2)

and Supply Chain Systems Engineering. It also offers a Master of Science Program in Engineering and Technology and Doctor of Philosophy Program in Engineering and Technology. Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology, Master of Engineering Program in Information and Communication Technology for Embedded Systems, and Master of Engineering Program in Logistics and Supply Chain Systems Engineering. It also offers a Master of Science Program in Engineering and Technology and Doctor of Philosophy Program in Engineering and Technology.

**Keywords:** Periodic solids, Effective properties, Extreme properties, Design automation, Material design

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## ACKNOWLEDGEMENTS

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Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology, Master of Engineering Program in Information and Communication Technology for Embedded Systems, and Master of Engineering Program in Logistics and Supply Chain Systems Engineering. It also offers a Master of Science Program in Engineering and Technology and Doctor of Philosophy Program in Engineering and Technology.

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Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology, Master of Engineering Program in Information and Communication Technology for Embedded Systems, and Master of Engineering Program in Logistics and Supply Chain Systems Engineering. It also offers a Master of Science Program in Engineering and Technology and Doctor of Philosophy Program in Engineering and Technology. Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology, Master of Engineering Program in Information and Communication Technology for Embedded Systems, and Master of Engineering Program in Logistics and Supply Chain Systems Engineering.

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Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology, Master of Engineering Program in Information and Communication Technology for Embedded Systems, and Master of Engineering Program in Logistics and Supply Chain Systems Engineering. It also offers a Master of Science Program in Engineering and Technology and Doctor of Philosophy Program in Engineering and Technology.

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LIST OF FIGURES (9)

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2.4 Sirindhorn International Institute of Technology 8

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## LIST OF SYMBOLS/ABBREVIATIONS

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### Symbols/Abbreviations

### Terms

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SIIT

Sirindhorn International Institute of  
Technology

TU

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## CHAPTER 1

### INTRODUCTION

Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology, Master of Engineering Program in Information and Communication Technology for Embedded Systems, and Master of Engineering Program in Logistics and Supply Chain Systems Engineering.

#### 1.1 Main heading

Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology, Master of Engineering Program in Information and Communication Technology for Embedded Systems, and Master of Engineering Program in Logistics and Supply Chain Systems Engineering (Chen & Winterbone, 2014).

Garlotta (2001) stated that “Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology, Master of Engineering Program in Information and Communication Technology for Embedded Systems, and Master of Engineering Program in Logistics and Supply Chain Systems Engineering” (p.63).

#### 1.2 Main heading

A study performed by Tokiwa and Calabia (2006) showed that Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology, Master of Engineering Program in Information and Communication Technology for Embedded Systems, and Master of Engineering Program in Logistics and Supply Chain Systems Engineering.

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### 1.2.1 Sub-heading 1

Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology, Master of Engineering Program in Information and Communication Technology for Embedded Systems, and Master of Engineering Program in Logistics and Supply Chain Systems Engineering (Bocchini & Frache, 2013; Smith, 2005).

#### 1.2.1.1 Sub-heading 2

Prokop, Helling, Hahn, Udomkaewkanjana and Rehm (2008) demonstrated Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology, Master of Engineering Program in Information and Communication Technology for Embedded Systems, and Master of Engineering Program in Logistics and Supply Chain Systems Engineering.

#### 1.2.1.2 Sub-heading 2

Montanari et al. (2003) found Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology, Master of Engineering Program in Information and Communication Technology for Embedded Systems, and Master of Engineering Program in Logistics and Supply Chain Systems Engineering.

Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology, Master of Engineering Program in Information and Communication Technology for Embedded Systems, and Master of Engineering Program in Logistics and Supply Chain Systems Engineering.

### 1.3 Main heading

Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology, Master of Engineering Program in Information and Communication

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Technology for Embedded Systems, and Master of Engineering Program in Logistics and Supply Chain Systems Engineering.

## CHAPTER 2

### REVIEW OF LITERATURE

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#### 2.1 Main heading

Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology. Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs.

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#### 2.2 Main heading

Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology.

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##### 2.2.1 Sub-heading 1

Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology. Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs.

Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology. Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs.

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### 2.2.1.1 Sub-heading 2

Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology.



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### 2.2.1.2 Sub-heading 2

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Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology. Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs.



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### 2.3 Main heading

Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology.



## CHAPTER 3

### INSERT TOPIC

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### 3.1 Main heading

Sirindhorn International Institute of Technology (SIIT) offers three master of engineering programs, namely, Master of Engineering Program in Engineering Technology, Master of Engineering Program in Information and Communication Technology for Embedded Systems, and Master of Engineering Program in Logistics and Supply Chain Systems Engineering:

- Sirindhorn International Institute of Technology (SIIT) Sirindhorn International Institute of Technology (SIIT),
- Sirindhorn International Institute of Technology (SIIT),
- Sirindhorn International Institute of Technology (SIIT).

Data of Sirindhorn International Institute of Technology (SIIT) are given in Table 3.1.

**Table 3.1** Sirindhorn International Institute of Technology (SIIT).

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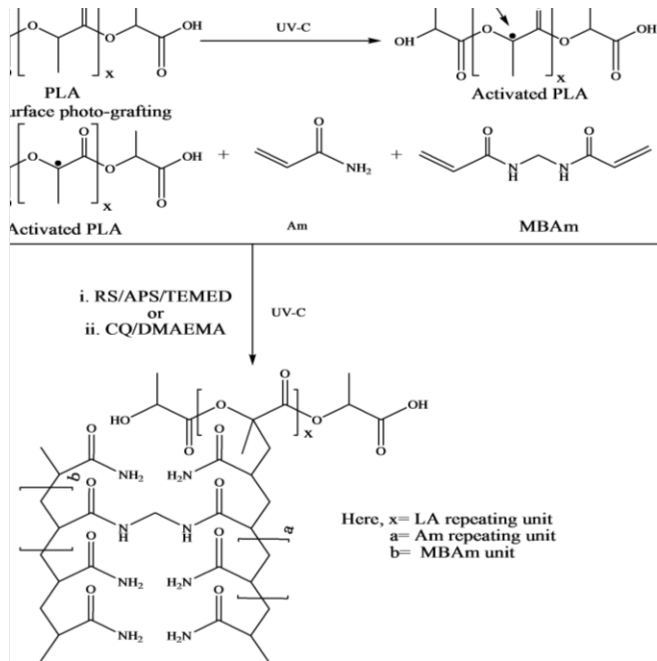
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#### 3.1.1 Sub-heading 1

The model of Sirindhorn International Institute of Technology (SIIT) is shown in Figure 3.1.



**Figure 3.1** Sirindhorn International Institute of Technology (SIIT).

Sirindhorn International Institute of Technology (SIIT) Sirindhorn International Institute of Technology (SIIT) Sirindhorn International Institute of Technology (SIIT).

Sirindhorn International Institute of Technology (SIIT) Sirindhorn International Institute of Technology (SIIT) Sirindhorn International Institute of Technology (SIIT). The moving average equation for replacing the outliers is given by the following equation:

$$L_t^p(d) = \int_0^L \sigma_{ij}^n(x) \epsilon_{ij}(x) \Delta_t^p(d) dx \quad (3.1)$$

where  $L_t^p(d)$  is the estimated load for the outlier detected at time period  $t$  of day  $d$ , and  $n$  is set to 2.

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Equation (3.1) shows Sirindhorn International Institute of Technology (SIIT) Sirindhorn International Institute of Technology (SIIT) Sirindhorn International Institute of Technology (SIIT). The parameters are given as

$$e_t(d) = L_t(d) - F_t(d) \quad (3.2)$$

$$e_t^p(d) = L_t^p(d) - F_t^p(d). \quad (3.3)$$

Equation (3.2) and Equation (3.3) are Sirindhorn International Institute of Technology (SIIT) Sirindhorn International Institute of Technology (SIIT) Sirindhorn International Institute of Technology (SIIT).

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Article title. *Periodical Title*, Volume (Issue), page number. doi:

**Books**

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**Internet**

Author, A., Author, B., & Author, C. (Year, Month Day). Title of Article [Description of form]. Retrieved from <http://www.xxx>

**APPENDICES**

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## BIOGRAPHY

Name International Institute

Education 2009: Bachelor of Engineering (Chemical Engineering)  
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2010: Master of Science (Environmental Science)  
Thammasat University

### Publications

Institute, I., Foo, M. E., & Gopinath, S. C. B. (2017). Feasibility of graphene in biomedical applications. *Biomedicine & Pharmacotherapy*, 94(Supplement C), 354-361.

Institute, I., Hanot, C. C., Choi, Y. S., Anani, T. B., Soundarrajan, D., & David, A. E. (2015). Effects of iron-oxide nanoparticle surface chemistry on uptake kinetics and cytotoxicity in CHO- K1 cells. *International Journal of Molecular Sciences*, 17(1), 226-230.

Institute, I., Sinervo, A., & Arkkio, A. (2012). Modeling two-pole cage induction machine equipped with embedded force actuator. *Proceedings of 10<sup>th</sup> International Conference on Vibrations in Rotating Machinery* (pp. 765-774). New York: Woodhead Publishing.

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