



# Institute of Space Technology

## QUALITY SYSTEM PROCEDURE

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# Thesis Guide

	NAME	DESIGNATION	SIGNATURE	DATE
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Institute of Space Technology	Document No.	IST-LIB-QSP-01/00
<b>Thesis Format</b>	Issue Date	
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**AMENDMENT SHEET**

<b>A M D . #</b>	<b>DA TE</b>	<b>INITIA TED BY</b>	<b>PA GE #</b>	<b>NATURE OF AMENDMENT</b>	<b>DONE BY</b>	<b>APPROVED BY</b>

Institute of Space Technology	Document No.	IST-LIB-QSP-01/00
<b>Thesis Format</b>	Issue Date	
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## THESIS GUIDE

All students of the Institute of Space Technology (IST) will adhere to the following guidelines while preparing their thesis:

### 1. Paper

The thesis must be printed on good quality white paper (80 grams) on one side of the paper only. Letter (8.5" x 11") size paper must be used in portrait orientation (vertical orientation).

### 2. Margins

Left-hand margin should be 1.5" wide to facilitate binding while right, top and bottom margins should be one inch.

### 3. Binding

Thesis should be submitted in hard binding according to the following specifications. Text on title page of the thesis should be used for preparing the binding (Sample cover page and spine label are attached at Annex – A, and Annex – B respectively). Colour of embossed text on binding should be SILVER for BS programs and GOLDEN for MS and PhD programs. Colour of binding itself should be according to the following departmental colour scheme:

a.	Aerospace Engineering	Dark Blue (IST Colour)
b.	Electrical Engineering	Maroon
c.	Material Science & Engineering	Green
d.	Space Science	Black
e.	Mechanical Engineering	Light Blue
f.	Remote Sensing & GISc	Grey

### 4. Font, headings, and line spacing

For the main body of the text, a standard Times New Roman font, with 12 point font size and double line spacing, should be used throughout the thesis except where instructed otherwise. Headings should stand out clearly from the text. Chapter headings and section headings should be in 14 and 12 point font size respectively. The title of thesis should be in UPPER CASE while remaining headings should be in Title Case and Sentence Case. Samples of heading styles are given in section 7.2.1. Footnotes should be 10 point but references or bibliography should be in 12 point font size. The thesis must be printed on a laser printer using black ink. For illustrations, colour printing can be used.

### 5. Page numbers

All pages must be numbered in sequence except title page. There must be no missing, blank, or duplicate pages. Specific page number formats are indicated in section seven. Chapter one must start on page 1.

Institute of Space Technology	Document No.	IST-LIB-QSP-01/00
<b>Thesis Format</b>	Issue Date	
	Department	Library

## 6. Footnotes

Footnotes should be numbered consecutively in text as superscript and detail of footnote should be given at the bottom of the page. Use Times New Roman font with 10 font size. For example:

<sup>1</sup>Charles Colson, Being Light In Darkness, (Dallas, TX: Word Publishing, 1992), p. 30.

<sup>2</sup>Marvin C. Pate, Engineering Design, (Grand Rapids, MI: CRC Press, 1996), p. 95.

## 7. Order and format of items in the thesis

The following order and format of items should be used in thesis:-

### 7.1 Preliminary pages

Preliminary pages should be numbered with lower case Roman numerals using Time New Roman font and 12 point font size at the center aligned bottom of the page.

Example:

ii

#### 7.1.1 Title page

Sample Title page is attached at Annex – C.

#### 7.1.2 Approval Page

Sample Approval page is attached at Annex – D.

#### 7.1.3 Certificate

Sample Certificate page is attached at Annex – E.

#### 7.1.4 Copyright Page

Sample for copyright page is attached at Annex – F.

#### 7.1.5 Dedication Page (optional)

You can dedicate your thesis to anyone. A dedication is simply a statement of who the thesis is dedicated to and you can or cannot give a reason.

#### 7.1.6 Abstract

Theses must have an abstract. Abstract requirements for theses may vary from department to department. Please check with your advisor if you have any questions about the length of abstract.

#### 7.1.7 Table of Contents

Sample for table of contents is attached at Annex – G.

#### 7.1.8 List of Tables (if applicable)

Sample for list of tables is attached at Annex – H.

#### 7.1.9 List of Figures (if applicable)

Sample for list of figures is attached at Annex – J.

Institute of Space Technology	Document No.	IST-LIB-QSP-01/00
<b>Thesis Format</b>	Issue Date	
	Department	Library

### **7.1.10 List of Abbreviations and Symbols Used**

List can be prepared in single column or two columns but it should be sorted alphabetically by abbreviations. Sample for list of abbreviations and symbols is attached at Annex – K.

### **7.1.11 Acknowledgements (optional)**

You can acknowledge financial, moral or physical help provided by your family, friends or anybody else during your thesis / research work but it is not compulsory.

## **7.2 Main Pages (numbered with Arabic numerals)**

Divide body of the text of your thesis into chapters. Pages should be numbered consecutively in Arabic numerals in Times New Roman font with 12 font size. Page numbers should be given in centre at bottom of the page. For example:

56

### **7.2.1 Heading style**

#### **1. CHAPTER TITLES SHOULD BE BOLD, CENTERED, UPPER CASE, TIMES NEW ROMAN, 14 POINTS**

The numbering for chapters should be in Arabic numerals as per example given above. Text of the chapter titles should be bold, centered, upper case, Times New Roman font with 14 points font size.

#### **1.1 Secondary Headings Should Be Flush Left, Bold, 12 Points**

The numbering for sections should be in Arabic numeral as per example given above. The first letter in each word of the secondary heading should be capitalized. Secondary heading should be flush left and bold with 12 points font size.

#### **1.1.1 Third level headings should be flush left, bold, 12 points**

The numbering for third level sections should be in Arabic numerals as per example given above. Only the first letter of the first word of the heading should be capitalized. Third level heading should be flush left and bold with 12 points font size.

### **7.2.2 Tables**

Tables should be centered between the left and right margin with their captions centered above the table. Tables should be consecutively numbered per chapter. The word Table should be spelled out (not abbreviated) on a line by itself with the table number, and the text of the caption should be centered in point size 12, Times New Roman.

Institute of Space Technology	Document No.	IST-LIB-QSP-01/00
<b>Thesis Format</b>	Issue Date	
	Department	Library

Example:

Table 1.1  
The caption should come before the table.

S/No	A	B	C
1	2.2	2.5	5.9
2	1.5	1.6	36

### 7.2.3 Figures

Figures should be centered between the left and right margin with their captions centered below the figure in point size 12 Times New Roman. Figures should be consecutively numbered per chapter. While numbering the figures, the word Figure should be abbreviated as "Fig.".

Example:

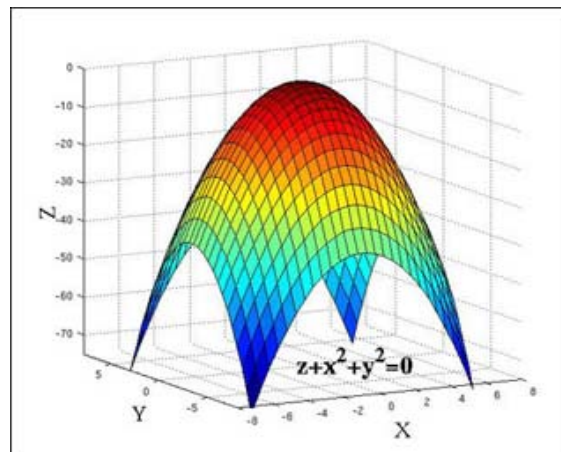


Fig. 1.1. The caption should come under the figure.

## 7.3 Final Pages (continuation of Arabic numerals)

### 7.3.1 References

References should be numbered consecutively as they appear in the text. Detailed reference should be given on a separate page at the end of the text, under the **References** heading using IEEE Citation Style Guide. Sample references are given below for your convenience:-

#### 7.3.1.1 Print References

##### Book

Author(s). Book title. Location: Publishing company, year, pp.

Example:

W.K. Chen. Linear Networks and Systems. Belmont, CA: Wadsworth, 1993, pp. 123-35.

Institute of Space Technology	Document No.	IST-LIB-QSP-01/00
<b>Thesis Format</b>	Issue Date	
	Department	Library

### **Book Chapters**

Author(s). "Chapter title" in Book title, edition, volume. Editors name, Ed. Publishing location: Publishing company, year, pp.

Example:

J.E. Bourne. "Synthetic structure of industrial plastics," in *Plastics*, 2<sup>nd</sup> ed., vol. 3. J. Peters, Ed. New York: McGraw-Hill, 1964, pp.15-67.

### **Article in a Journal**

Author(s). "Article title". Journal title, vol., pp, date.

Example:

G. Pevere. "Infrared Nation." *The International Journal of Infrared Design*, vol. 33, pp. 56-99, Jan. 1979.

### **Articles from Conference Proceedings (published)**

Author(s). "Article title." Conference proceedings, year, pp.

Example:

D.B. Payne and H.G. Gunhold. "Digital sundials and broadband technology," in *Proc. IOOC-ECOC*, 1986, pp. 557-998.

### **Papers Presented at Conferences (unpublished)**

Author(s). "Paper's title," Conference name, Location, year.

Example:

B. Brandli and M. Dick. "Engineering names and concepts," presented at the 2<sup>nd</sup> Int. Conf. Engineering Education, Frankfurt, Germany, 1999.

### **Standards/Patents**

Author(s)/Inventor(s). "Name/Title." Country where patent is registered. Patent number, date.

Example:

E.E. Rebecca. "Alternating current fed power supply." U.S. Patent 7 897 777, Nov. 3, 1987.

## **7.3.1.2 Electronic References**

### **Book**

Author. (year, Month day). Book title. (edition). [Type of medium]. Vol. (issue). Available: site/path/file [date accessed].

Example:

S. Calmer. (1999, June 1). *Engineering and Art*. (2<sup>nd</sup> edition). [On-line]. 27(3). Available: [www.enggart.com/examples/students.html](http://www.enggart.com/examples/students.html) [May 21, 2003].

### **Journal**

Author. (year, month). "Article title." Journal title. [Type of medium]. Vol. (issue), pages. Available: site/path/file [date accessed].

Example:

A. Paul. (1987, Oct.). "Electrical properties of flying machines." *Flying Machines*. [On-line]. 38(1), pp. 778-998. Available: [www.flyingmachjourn/properties/fly.edu](http://www.flyingmachjourn/properties/fly.edu) [Dec. 1, 2003].

Institute of Space Technology	Document No.	IST-LIB-QSP-01/00
<b>Thesis Format</b>	Issue Date	
	Department	Library

### **World Wide Web**

Author(s)\*. "Title." Internet: complete URL, date updated\* [date accessed].

M. Duncan. "Engineering Concepts on Ice. Internet: [www.iceengg.edu/staff.html](http://www.iceengg.edu/staff.html), Oct. 25, 2000 [Nov. 29, 2003].

### **7.3.1.3 Odd Sources**

#### **Newspaper**

Author(s)\*. "Article title." Newspaper (month, year), section, pages.

Examples:

B. Bart. "Going Faster." Globe and Mail (Oct. 14, 2002), sec. A p.1.

"Telehealth in Alberta." Toronto Star (Nov. 12, 2003), sec. G pp. 1-3.

#### **Dissertations and Theses**

Author. "Title." Degree level, school, location, year.

Example:

S. Mack. "Desperate Optimism." M.A. thesis, University of Calgary, Canada, 2000.

#### **Lecture**

Lecturer(s). Occasion, Topic: "Lecture title." Location, date.

Example:

S. Maw. Engg 251. Class Lecture, Topic: "Speed skating." ICT 224, Faculty of Engineering, University of Calgary, Calgary, Alberta, Oct. 31, 2003.

#### **E-mail**

Author. Subject line of posting. Personal E-mail (date).

Example:

J. Aston. "RE: new location, okay?" Personal e-mail (Jul. 3, 2003).

#### **Internet - Newsgroup**

Author or Topic\*, "Title," Complete network address, date when it was updated [date accessed].

Example:

G.G. Gavin. "Climbing and limb torsion #3387," USENET: sci.climb.torsion, Apr. 19, 2000 [Oct. 4, 2002].

\* if you can't find this information, exclude it.

#### **Exact page number References**

To refer readers to specific page numbers in a text, use the number of the reference followed by a colon (:) and the page numbers.

Example:

Johnson suggests that citing will lead to a decrease in being cited for plagiarism [1:28-29]. The [1] refers to the numbered reference and the 28-29 refers to the pages being cited.



Institute of Space Technology	Document No.	IST-LIB-QSP-01/00
<b>Thesis Format</b>	Issue Date	
	Department	Library

### 7.3.2 Bibliography (optional)

If you want to provide bibliography of related literature, in addition to the literature referred to in the body of thesis text, you can do so but it is not compulsory.

### 7.3.3 Appendices (optional)

If you want to provide additional / related material, which may be helpful in understanding the text of your thesis, you can do so in the form of appendices but these are not compulsory.

Appendices should be numbered with English Alphabets on right side of the page.

Example:

### Appendix - A

## 8. Electronic supplements

Copy of thesis (full text), with all relevant materials, should be provided on a CD/DVD along with the thesis. CD/DVD should be labeled with student's name, thesis title, institution, date etc., and should be placed in a pocket attached to the inner side of back cover.

## 9. Checklist

Please check your thesis in the light of following checklist before submission. This checklist will help you in deciding whether your thesis is ready for submission or not. If answer to any one of following questions is in NO then your thesis is not yet ready for submission.

- Have you prepared your thesis according to the instructions given in this guide?
- Have you formatted your thesis according to the instructions given in this guide?
- Have you numbered all pages of your thesis according to the instructions given in this guide?
- Have you placed all items in your thesis in correct order according to prescribed format?
- Have you printed your thesis on good quality white paper (80 grams)?
- Have you got your thesis bound according to the sample provided in this guide?
- Have you chosen right colours for binding according to your department?
- Have you obtained signature on the certificate page from your supervisor?
- Have you attached an electronic copy of thesis and related files in every copy of your thesis?
- Was your thesis processed for plagiarism checking?

## 10. Related Forms and Templates

Form Number	Form Name	Form Location (Path)	User

## 11. Related Records

Record Name	Storage Mode (Soft/Hard)	Responsible	Retention Time
Thesis	Soft / Hard	Library	Forever
Thesis	Soft / Hard	HOD of concerned Department	Forever

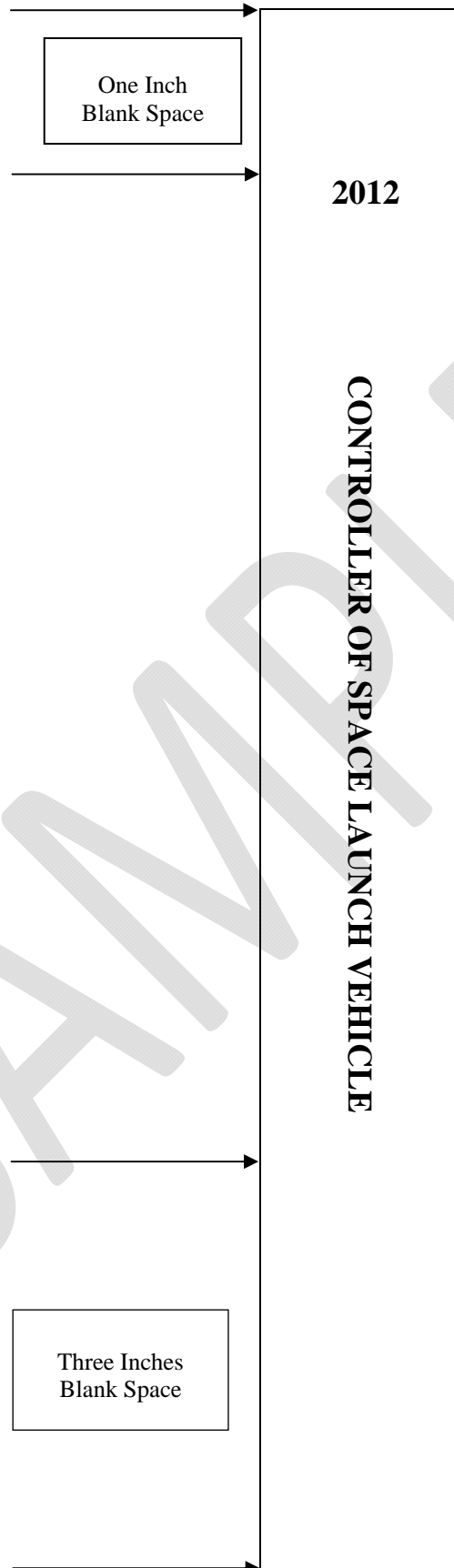
# CONTROLLER OF SPACE LAUNCH VEHICLE



by  
Sunie Hassan  
Shaharyar Malik

Supervisor  
Dr. Sarwar Naqvi

Department of Aeronautics and Astronautics  
Institute of Space Technology, Islamabad  
2012



# CONTROLLER OF SPACE LAUNCH VEHICLE

A thesis submitted to the  
Institute of Space Technology  
in partial fulfillment of the requirements  
for the degree of Bachelor of Science in  
Aerospace Engineering

by

Sunie Hassan  
Shaharyar Malik

Supervisor  
Dr. Sarwar Naqvi

Department of Aeronautics and Astronautics  
Institute of Space Technology, Islamabad  
August 2012

Institute of Space Technology

Department of Aeronautics & Astronautics



# Controller of Space Launch Vehicle

by

Sunie Hassan  
Shaharyar Malik

APPROVAL BY BOARD OF EXAMINERS

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Supervisor's Name

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Advisor 1 (Name)

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Advisor 2 (Name)

**Certificate**

This is to certify that the research work described in this thesis is the original work of author(s) and has been carried out under my direct supervision. I have personally gone through all the data/results/materials reported in the manuscript and certify their correctness/authenticity. I further certify that the material included in this thesis is not plagiarized and has not been used in part or full in a manuscript already submitted or in the process of submission in partial/complete fulfillment of the award of any other degree from any institution. I also certify that the thesis has been prepared under my supervision according to the prescribed format and I endorse its evaluation for the award of Bachelor of Science in Aerospace Engineering degree through the official procedures of the Institute.

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(Prof. Dr. Sarwar Naqvi)

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**Table of Contents**

	<b>Page No.</b>
Approval page	i
Certificate	i
Acknowledgement	ii
Abstract	iii
Table of contents	iv
List of tables	v
List of figures	vi
Abbreviations	vii
1. Introduction	1
1.1 General	1
1.2 Laser Range Finder	2
1.3 Laboratory Model	2
1.4 Scanning Assembly	3



**List of Tables**

<b>Table No.</b>	<b>Table Caption</b>	<b>Page No.</b>
1.1	Roary encoder	6
1.2	Properties of worm gears	6
2.1	Approximate strain gauge	8
2.2	Data acquisition	20

SAMPLE

**List of Figures**

<b>Figure No.</b>	<b>Figure Caption</b>	<b>Page No.</b>
4.1	Schematic diagram of filter A	38
4.2	Schematic diagram of filter B	39
4.3	Analysis of fine gears	51
4.4	Removal in filter A (second cycle)	62
4.5	Removal in filter B (second cycle)	63

SAMPLE

### List of Abbreviations and Symbols

mg/l	Micro gram per liter
ppb	Parts per billion
ppm	Parts per million
SORAS	Solar Oxidation
UN	United Nations

SAMPLE