GUIDELINES

FOR THE PREPARATION OF M.S. (by Research) Ph.D. / SYNOPSIS REPORT

NATIONAL INSTITUTE OF TECHNOLOGY

TIRUCHIRAPALLI – 620 015

DECEMBER 2009

SYNOPSIS

THE ARRANGEMENT OF PARTS OF THE SYNOPSIS OF A Ph.D. / M.S. Synopsis

1. **Cover Page :** A Sample sheet is enclosed (Annexure 1)
2. **Title :** Should be as short as possible and accurate
3. **Introduction:** Outline briefly the technological / engineering / scientific / Socio – economic relevance or significance of the research work is being reported.
4. **Motivation:** Trace to the pint, the developments in the area, to emphasize the current status and importance of the research problem identified.
5. **Objective(s) and Scope:** State clearly the questions for which answers are sought through this research. Define the conceptual, analytical, experimental and / or methodological boundaries within the exercise has been carried out.
6. **Description of the research work :** Give brief, but sufficient, details regarding
    a. The research problems
    b. Solution methodologies, and
    c. Interpretation of the results / output
7. **Conclusions / Limitations :** Highlight major (and not all) Conclusions / Limitations
8. **References:** List them according to the given format. All these must have been referred to in the text of the synopsis. (Annexure 2)
9. **Tables and figures:** All these must be captioned, serially numbered and referred to in the text.
10. **Proposed content of the Thesis:** Include only chapter and section titles. (Annexure 3)
11. List of publications based on the research work.
12. The style of presentation (fonts, chapter No., margins, section and sub section no.,, equation number, figures, tables, etc.) must be same as in the thesis.
13. The synopsis must be presented within a maximum of **<u>20</u>** pages (10 sheets back to back), excluding the cover page.

GUIDELINES FOR THE PREPARATION OF SYNOPSIS 1. TITLE PAGE

The title of the synopsis should be as concise as possible. It must occur consistently in every respect, including punctuation, capitalization, and hyphenation, on the abstract and approval forms. On the title page, the identical title must appear in all capital letters with each line centered on the page. The month in which the synopsis is submitted, e.g., May, August, or January is to be printed at the bottom of the page. The title page is not numbered, but it is counted.

2. PAGE DIMENSIONS AND MARGIN

The synopsis should be prepared on good quality white paper preferably not lower than 80 gsm. Standard A4 size (210 mm X 297 mm) paper should be used for preparing the copies. The final synopsis should have the following page margins:

Top edge : 1 inch (25 mm)

Left side : 1 ½ inch (38 mm)

Bottom edge : 1 inch (25 mm) Right side : 1 inch (25 mm)

3. TYPE-SETTING, TEXT PROCESSING AND PRINTING

The text shall be printed employing Laserjet or Inkjet printer, the text having been processed using a standard text processor. The standard font shall be Times New Roman of 12 pts with 1.5 line spacing. **The text must be 1.5 lines spaced and printed on back to back of each page.**

Text

The text must be divided into a logical scheme that is followed consistently throughout the document. The larger divisions and more important minor divisions are indicated by suitable, consistent headings. Chapter organization as practiced by the discipline should be followed. Specific requirements for text presentation follow.

1. Headings and Subheadings

The scholar may use headings and subheadings to subdivide chapters or sections, but a consistent sequence of headings as identified in the style guide selected must be followed. Once the sequence is chosen, it must be followed consistently throughout the synopsis.

Sections and sub-sections can be numbered using decimal points, e.g., 1.2, 1.2.1. Use only Arabic Numerals with decimals. Section numbering should be left justified using large bold print. Sub section numbering should be left justified using large bold print.

2. **Introduction** shall justify and highlight the problem poser and define the topic and the aim and scope of the work presented in the synopsis. It may also highlight the significant contributions from the investigation.

3. **Review of Literature** shall present a critical appraisal of the previous work published in the literature pertaining to the topic of the investigation. The extent and emphasis of the **Literature** shall depend on the nature of the investigation.

   For Example,

   Several researchers attempted to develop mathematical models to simulate the activated sludge process. Some of these models simulate the organic removal mechanisms in wastewater treatment field, which were included in Jorgensen and Gromiec (1985), Henze (1986), Henze et al. (1987a), Tang et al. (1987), and Van Niekerk et al. (1988). The oxygen transfer mechanism has an important place in the activated sludge process. An estimation technique for the oxygen transfer capacity is investigated by Stenstrom et al. (1989).

4. Tables, Figures and equations Format

The term "table" refers to a columnar arrangement of information, often data sets, organized to save space and convey relationships at a glance. The term "figure" refers to graphs, drawings, diagrams, charts, maps, or photographs. All such details should be inserted in the text near where they are first mentioned. A table or figure may appear on the same page as the text that refers to it or on a separate page. Each figure or table must be numbered and have a caption. Captions are placed below figures and pictures and above tables. Captions may be single-or double-spaced. As far as possible tables and figures should be presented in portrait style. Small size table and figures (less than half of writing area of a page) should be incorporated within the text, while larger ones may be presented in separate pages. Table and figures shall be numbered. For example, **Figure 1** or *Fig.1 Table* number and title will be placed above the table while the figure number and caption will be located below the figure. Reference for Table and Figures reproduced from elsewhere shall be cited in the last and separate line in the table and figure caption, e.g. (after McGregor [12]).

All the equations should be typed in equation editor and should be properly numbered

For Example,

$$\Delta X \alpha X \Delta t \quad (1)$$

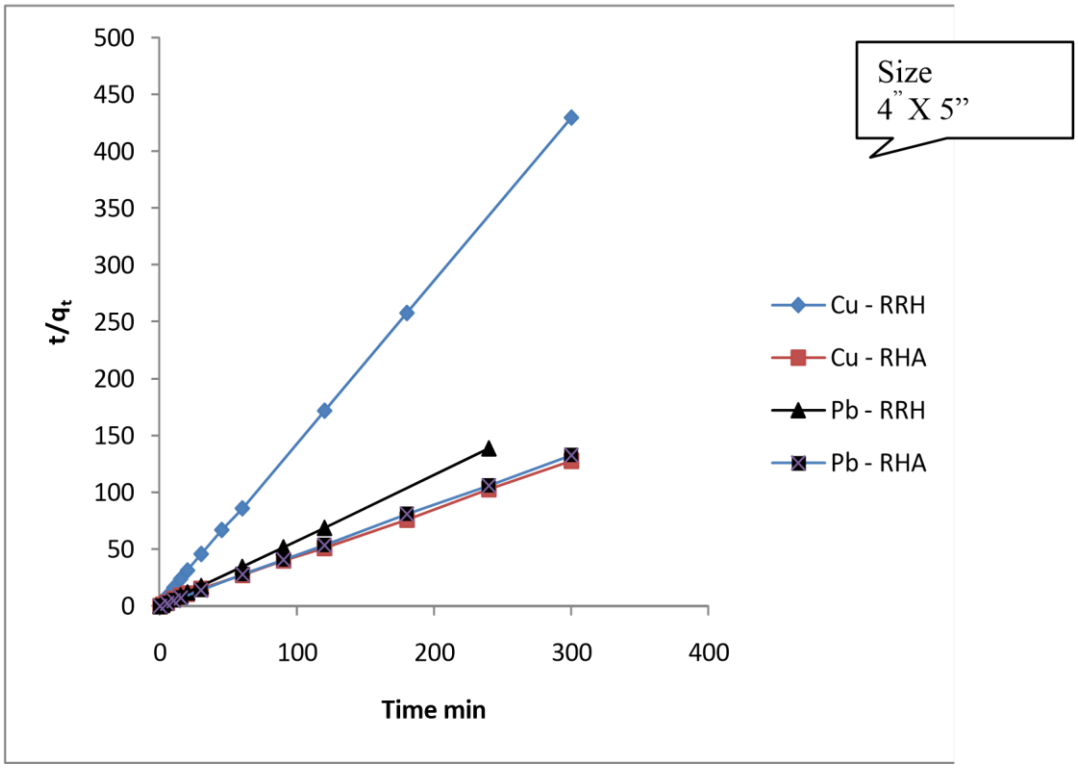

Fig. 1. Pseudo Second order plot for Copper and Lead on RRH and RHA

Table 1. Desorption Study

Cycle	Metal/ Adsorbent	Copper		Lead	
		RRH	RHA	RRH	RHA
1	Adsorption	73%	97.5%	81%	98%
	Desorption	99%	99.5%	98.5%	99%
2	Adsorption	40%	30%	80%	38%
	Desorption	99%	99%	98%	99%

5. **Results and Discussions:** This shall form the penultimate the synopsis and shall include a thorough evaluation of the investigation carried out and bring out the contributions from the study. The discussion shall logically lead to inferences and conclusions as well as scope for possible further future work.

6. **Summary and Conclusions:** A brief report of the work carried out shall form the first part of the **Summary and Conclusions**. Conclusions derived from the logical analysis presented in the Results and Discussions shall be presented and clearly enumerated, each point stated separately. Scope for future work should be stated lucidly in the last part of the **Summary and Conclusions.**

7. Pagination

Lower-case Roman numerals are used to number all pages preceding the text. Beginning with the first page of the text, all pages are to be numbered with Arabic numerals consecutively throughout the synopsis document, including the list of references. The Arabic numerals must be positioned at the bottom of the page, centered between the margins. Page headers or running heads may not be used in the synopsis.

8. Binding

The synopsis shall be soft cover bound in leather or rexin with the black edge soft binding

9. Front Covers

The front cover shall contain the following details:

- Full title of synopsis in 14 point's size font properly centered and positioned at the top.
- Full name of the candidate in 14 point's size font properly centered at the middle of the page.
- A 1.25 inch X 1.25 inch size of the Institute emblem followed by the name of the Department, name of the Institute and the month and year of submission, each in a separate line and properly centered and located at the bottom of the page.

Annexure 1
(Sample)

SYNOPSIS OF

TITLE OF THE SYNOPSIS

Size
14 points (Bold Centre)

A THESIS

to be submitted by

Size
14 points (Bold)

NAME OF THE SCHOLAR

for the award of the degree

of

DOCTOR OF PHILOSOPHY

15 points (Bold)

Size

NAME OF THE DEPARTMENT
NATIONAL INSTITUTE OF TECHNOLOGY

TIRUCHIRAPALLI-620015

DECEMBER 2009

Annexure 2
(Sample)

References 1. For papers by Single Author,

Bruce Rittmann, E. (1996) How input biomass affects sludge age and process stability. *ASCE: Jour.Env.Engg*, **122**, 4-8.

2. For papers by Two Authors,

Bliss, P. J. and D. Barnas (1986) Modeling Nitrification in Plant Scale Activated Sludge. *Water Science and Technology*, **18**,139-148.

3. For papers by more than two Author,

Capodaglio, A.G., H.V. Jones, V. Novotny and X. Feng (1991) Sludge bulking analysis and forecasting: application of system identification and artificial neural computing technologies. *Water Res.*, **25**, 1217–24.

4. For books

APHA, AWWA and WPCF *Standard methods for the examination of water and wastewater*, 17th Edition, Washington, D.C.: American Public Health Association, 1989.

Annexure 3
(Sample)

PROPOSED CONTENTS OF THE THESIS

CHAPTER 1 INTRODUCTION

1.1 General 1.2 Objectives

CHAPTER 2 LITERATURE REVIEW

2.1 Membrane

2.2 Membrane Separation Technology

2.3 Types of Membranes

2.4 Membrane Separation Process

2.5 Liquid Emulsion Membrane 2.6 Types of Extraction Mechanism

CHAPTER 3 METHODOLOGY

3.1 Materials 3.1.1 Span 80

3.1.2 n- Hexane

3.1.3 Sodium hydroxide

3.2 Experimental Procedure 3.2.1 Emulsion preparation

3.2.2 Extraction process

3.3 Operating Conditions

CHAPTER 4 RESULTS AND DISCUSSION

4.1 General

4.2 Effect of Span 80

4.3 Effect of NaOH Concentration

4.4 Effect of n-Hexane

4.5 Effect of Stirring Speed During Extraction

4.6 Effect of Feed Concentration **CHAPTER 5 SUMMARY AND CONCLUSION**

5.1 Summary

5.2 Conclusions

5.3 Scope for Future Work

REFERENCES

Annexure 4

(Sample)

LIST OF PAPERS
SUBMITTED ON THE BASIS OF THE THESIS

The papers based on the research work reported in the synopsis could be listed under the broad headings "Journals" and "Conferences" indicating their current status (published / accepted) within parenthesis at the end of each section.

I REFEREED JOURNALS

1. **Chen, J.** and **M.B. Beck** (1993) Modeling control and offline estimation of Activated sludge bulking. *Water Sci. Technology*, **28**, 249-256.

2. **Anderson, J. S., H. Kim, T. J. Mc Avoy and O. J. Hao** Control of an Alternating Aerobic-anoxic Activated Sludge System-I; Development of a Linearization-based Modeling Approach. *Control Engineering Practice (Accepted)*.

II PRESENTATIONS IN CONFERENCES

1. **Rosen, C.** and **J.A. Lennox** (2001) Multivariate and multiscale monitoring of wastewater treatment operation. International Conference on Software Engineering, Cape Town, South Africa, May, 2008.

Note: publications in any unrefereed journals, magazines, volumes etc. should not be listed)

QUICK REFERENCE

PAGE DIMENSIONS AND MARGIN

Paper size	: 80 gsm. Standard A4 size (210 mm X 297 mm)
Margins	
Top edge	: 1 inch (25 mm)
Left side	: 1 ½ inch (38 mm)
Bottom edge	: 1 inch (25 mm)
Right side	: 1 inch (25 mm)
Print out	: Laserjet or Inkjet printer, **printed on both sides**
Font size (regular Text)	: Times New Roman of 12 pts
Spacing	: 1.5 line spacing
Sections	: 12 pts bold left aligned (Capital Letters)
Subsections	: 12 pts bold left aligned (Title case)
Page numbers	: Bottom – centered – 12 pts (1, 2, 3…)
Binding	: Soft binding (edge with black color strip)

Number of copies

M.S. / Ph.D.	: 10