
GUIDELINES
FOR THE PREPARATION OF
B.Tech Project Report



NAME OF THE DEPARTMENT
GOVERNMENT ENGINEERING COLLEGE, JEHANABAD
BIHAR - 804407

MAY 2024

Project Report

The arrangement of parts of B.Tech. Project Report

The sequence in which the Project Report material should be arranged and bound should be as follows:

1. Cover page
2. Inside title page
3. Dedication page(Optional)
4. Certificate signed by the supervisor(s)
5. Declaration signed by the candidate
6. Abstract
7. Acknowledgements
8. Table of Contents
9. List of Tables
10. List of Figures
11. List of Symbols, Abbreviations or Nomenclature(Optional)
12. Chapters (Text of the Report)
 - Chapter 1
 - Chapter 2
 -
 -
13. Appendices
14. References

The formats in various headings are given below

Cover page	See Annexure 1
Inside title page	Same as Cover page
Dedication page(if Any)	Should not exceed one page
Certificate signed by supervisor	See Annexure 2
Declaration signed by the candidate	See Annexure 3
Abstract	Should not exceed two pages (about 600 words and should contain a maximum of 6 key words) See Annexure 4
Acknowledgements	Should not exceed two pages
Table of Contents	See Annexure 5
List of Tables	See Annexure 6
List of Figures	See Annexure 7
List of Symbols, Abbreviations or Nomenclature(Optional)	See Annexure 8,9
References	See Annexure 10

GUIDELINES FOR PREPARATION OF PROJECT REPORT

PROJECT REPORT FORMAT

The Project Report is divided into three main parts:

- (i) Preliminary pages,
- (ii) The main body (text) and
- (iii) Reference materials.

Preliminaries

The preliminary includes the Title Page, Certificate, Abstract, Dedication (optional), Acknowledgements, Table of contents, List of tables, List of figures and other lists. These pages have separate pagination from the main text. Although the title page is counted, it is not numbered. Starting from the page right after the title page, use lowercase Roman numerals centered at the bottom for page numbers. The Roman numerals pagination continues until the first page of the main text.

Proper Order of Preliminary Pages:

1. Title Page

The title of the Project Report should be concise and consistent in all instances, including punctuation, capitalization, and hyphenation, as it appears on the abstract and approval forms. On the title page, the title must be in all capital letters and centered on each line. The month of submission (e.g., May, August, or January) should be printed at the bottom of the page. The title page is counted but not numbered..

2. Abstract

The abstract should be a brief, descriptive summary of the Project Report, not exceeding 600 words. It should be double-spaced and follow the same style manual as the Project Report manuscript. The abstract should include relevant place names, names of persons, and other proper nouns to aid in automated retrieval. The abstract page uses a lower-case Roman numeral for pagination..

3. Dedication (optional)

The dedication should be brief, single-spaced, and centered both horizontally and vertically on the page. It does not have a heading, and traditionally begins with the word “To.

4. Acknowledgement

This section starts with the title "ACKNOWLEDGEMENTS" centered in all capital letters. It is used to thank individuals who have significantly helped the student complete the degree requirements. Acknowledgement of grants and special funding for the research may also be included.

5. Table of Contents

The Table of Contents must list all chapter headings, the bibliography, and appendices. Entries should be 1.5 lines spaced. Major section headings (e.g., chapters, bibliography, appendices) must be in all capital letters. These headings must match those in the text exactly. Page numbers should be right-justified and connected to their entries by a line of evenly spaced dot leaders (periods). The words "TABLE OF CONTENTS" should be centered on the page two inches from the top on the first page only.

6. List of Tables (if tables are included in the document)

The heading "LIST OF TABLES" should be centered two inches from the top of the first page only. All table numbers and captions must be listed exactly as they appear in the text.

7. List of Figures (if figures are included in the document)

The heading "LIST OF FIGURES" should be centered two inches from the top of the first page only. All figure numbers and captions must be listed exactly as they appear in the text.

8. Other Lists (nomenclature, definitions, glossary of terms, etc.)

The appropriate title in all capital letters should be centered two inches from the top of the first page only.

Page Dimensions and Margins

The Project Report should be printed on high-quality white paper, preferably not less than 80 gsm. Standard A4 size paper (210 mm x 297 mm) should be used. The final report should have the following page margins:

- Top edge: 1 inch (25 mm)
- Left side: $1\frac{1}{2}$ inches (38 mm)
- Bottom edge: 1 inch (25 mm)
- Right side: 1 inch (25 mm)

Type-Setting, Text Processing, and Printing

The text should be printed using a Laserjet or Inkjet printer, processed with a standard text processor. The standard font should be Times New Roman, 12 pts, with 1.5 line spacing. Text should be printed on one side of each page.

Text

The text must be divided into a logical scheme and followed consistently throughout the document. Major and minor divisions should be indicated by appropriate, consistent headings. Chapter organization should follow the discipline's practice. The student and academic department are responsible for the text's quality and content. Specific requirements for text presentation are detailed below.

General Guidelines for Project Report Formatting

1. Headings and Subheadings

Students may use headings and subheadings to divide chapters or sections, but they must follow a consistent sequence as specified by the chosen style guide. The sequence and style of headings must remain consistent throughout the Project Report.

2. Pagination

Lower-case Roman numerals are used for all preliminary pages. Although pagination starts with the title page, no number appears on it. The page following the title page is numbered with a lower-case Roman numeral. Arabic numerals are used consecutively from the first page of the main text through to the appendices and bibliography. Arabic numerals should be centered at the bottom of each page. Page headers or running heads are not allowed.

3. Tables & Figures

Tables present columnar information, often data sets, to save space and convey relationships. Figures include graphs, drawings, diagrams, charts, maps, or photographs. Tables and figures should be placed near their first mention in the text. They can appear on the same page as the text or on a separate page. Each must be numbered and have a caption, with captions below figures and above tables. Captions can be single- or double-spaced.

4. Illustrations

Illustrations must be mentioned in the text and placed as near as possible to the first reference. They should be prepared on paper of the same weight and font type as the rest of the manuscript. If mounted, dry mounting must be used; other adhesives are not allowed. Illustrations must be drawn or computer-generated in black and may be laser-printed or drawn in waterproof, permanent ink.

Color should only be used if essential, as it reproduces in microfilm as shades of grey.

5. Photographs

High-quality, high-contrast copying machines are recommended for reproducing photographs. If original photographs are used, they should be printed on single-weight, fiber-based paper with a matte finish, processed to national standards for chemical permanence. Black-and-white prints are preferable. Photograph page numbers should follow standard pagination requirements.

6. Appendix or Appendices

The appendix (or appendices) follows the main text and includes supplementary material that is too lengthy for the text or footnotes. The title, APPENDIX, should appear on the first page of the section, centered two inches from the top. Examples include questionnaires, letters, original data, sample forms, and vitae. Each appendix is a separate subdivision and must begin on a new page. Each appendix must be listed in the Table of Contents.

Organization of the Project Report

The Project Report is divided into chapters, beginning with an introduction and ending with a summary and conclusions. Each chapter should have a precise title reflecting its content and may be subdivided into sections and sub-sections. Each chapter starts on a new page.

1. Chapter and Section Format

Chapter 1 is titled Introduction and should justify the problem posed, define the topic, and outline the scope of the work. It may also highlight significant contributions from the investigation. Use Arabic numerals for chapter numbering, centered at the top of the page in large bold print.

Example: CHAPTER 1

Sections within chapters are numbered using decimal points. Section numbers should be left-justified in large bold print.

Example: 1.1 GENERAL

1.2 ADSORPTION

Sub-sections use two decimal points for numbering.

Example: 1.1.1 Adsorption Isotherms

1.1.2 Langmuir Isotherms

2. Review of Literature

This chapter, usually Chapter 2, critically appraises previous work related to the investigation. The extent and emphasis depend on the nature of the study.

Example: Several researchers have developed mathematical models to simulate the activated sludge process, including those by Jorgensen and Gromiec (1985), Henze (1986), Henze et al. (1987a), Tang et al. (1987), and Van Niekerk et al. (1988). Stenstrom et al. (1989) investigated oxygen transfer capacity estimation in the activated sludge process.

3. Results and Discussion

This penultimate chapter includes a thorough evaluation of the investigation, highlighting contributions from the study. The discussion should logically lead to inferences and conclusions, and suggest possible future work.

4. Table/Figure Format

Tables and figures should preferably be in portrait style. Small tables and figures (less than half the writing area) should be integrated within the text, while larger ones may be on separate pages. Number tables and figures chapter-wise. For example, the fourth figure in Chapter 5 will be Figure 5.4 or Fig. 5.4. Table numbers and titles are placed above the table, while figure numbers and captions are below the figure. References for reproduced tables and figures should be cited in the caption.

Example: Equation Example: $\Delta X \propto X \Delta t$ (2.1)

Table Example:

Cycle	Metal/ Adsorbent	Copper	Lead
	RRH	RHA	RRH
1	Adsorption	73%	97.5%
	Desorption	99%	99.5%
2	Adsorption	40%	30%
	Desorption	99%	99%

5. Summary and Conclusions

The final chapter provides a brief summary of the work and presents conclusions drawn from the results and discussions. It should also outline the scope for future work.

Note: This is only a sample.

6. Binding






The Project Report should be soft cover bound in leather or rexin with black edge soft binding.

7. Front Covers

The front cover should include:

- Full title of the Project Report in 20-point size font, centered at the top and should be on side line with 12-point size font.
- Full name of the candidate/ group member including with registration number in 14-point size font, centered in the middle.
- A 1.25 x 1.25 inch Institute emblem, followed by the department name, institute name, and year of submission, each on a separate line, centered at the bottom.

8. Thesis's Hard Cover Page Color:

Name of the Branch	Base Color	Font Color
Electrical Engineering	Maroon 	Golden
Civil Engineering	Light Blue 	Black
Mechanical Engineering	Dark Blue 	Silver
Electronics and Communication Engineering	Black 	Golden
Computer Science Engineering	Olive Green 	Silver

TITLE OF THE PROJECT REPORT



Size 18 Points
Bold (Centered)

A project report submitted in partial fulfillment of the
requirements for the award of the degree of

B.Tech



Size 14 Points
Bold (Centered)

in

Name of the Department

By

Name of the student (Registration Number)



Size 14 Points
Bold (Centered)



NAME OF THE DEPARTMENT
GOVERNMENT ENGINEERING COLLEGE, JEHANABAD
BIHAR - 804407



Size 14 Points
Bold (Centered)

MAY2024

BONAFIDE CERTIFICATE

This is to certify that the project titled **TITLE OF THE Project Report** is a bonafide record of the work done by

Name of the Student (Roll Number)

in partial fulfillment of the requirements for the award of the degree of **Bachelor of Technology in Specialization** of the **Government Engineering College, Jehanabad**, during the year 2020-2024.

NAME
Guide

NAME
Head of the Department

Project Viva-voce held on _____

Internal Examiner

External Examiner

ABSTRACT

Annexure4 (Sample)

Removal of colour from industrial wastewater can be achieved by extraction using liquid emulsion membrane. A dye, named, Crystal Violet (CV) is extracted using water/oil/water liquid emulsion membrane. An experiment on single dye component is carried out. A stable emulsion is formed by agitating NaOH solution and an organic solvent (n-hexane) at high speed. Span 80 (surfactant) is used to stabilize the membrane. Extraction is carried out by dispersing the emulsion in an external water phase (feed) at lower speed resulting in the formation of small globules thereby increasing surface area and providing better extraction. The constituent (dye) to be extracted from the external phase diffuses through the membrane phase into the internal phase (NaOH solution). Reaction occurs in the internal phase resulting in the formation of sodium salt of the dye (s). The emulsion can be reused after demulsification. During extraction, the effect of Span 80, NaOH concentration, n-hexane, stirring speed and feed concentration have been investigated. The main objective of this study is to find the optimum operating conditions for the extraction of crystal violet.

Keywords :Emulsion; Internal phase; Extraction; Diffusion; Dye separation

TABLE OF CONTENTS

Title	PageNo.
ABSTRACT	i
ACKNOWLEDGEMENTS	ii
TABLE OF CONTENTS	iii
LIST OF TABLES	v
LIST OF FIGURES	vi
CHAPTER 1 INTRODUCTION	
1.1 General	1
1.2 Objectives.....	2
CHAPTER 2 LITERATURE REVIEW	
2.1 Membrane.....	3
2.2 Membrane Separation Technology.....	3
2.3 Types of Membranes.....	3
2.4 Membrane Separation Process.....	3
2.5 Liquid Emulsion Membrane.....	4
2.6 Types of Extraction Mechanism.....	6
CHAPTER 3 METHODOLOGY	
3.1 Materials.....	7
3.1.1 Span80.....	7
3.1.2 n-Hexane.....	8
3.1.3 Sodium hydroxide.....	8
3.2 Experimental Procedure.....	9
3.2.1 Emulsion preparation.....	9
3.2.2 Extraction process.....	10
3.3 Operating Conditions.....	11
CHAPTER 4 RESULTS AND DISCUSSION	
4.1 General.....	14
4.2 Effect of Span 80	14

4.3	Effect of NaOH Concentration.....	15
4.4	Effect of n-Hexane.....	17
4.5	Effect of Stirring Speed During Extraction	18
4.6	Effect of Feed Concentration	19

CHAPTER5 SUMMARYANDCONCLUSION

5.1	Summary.....	21
5.2	Conclusions.....	21
5.3	Scope for Future Work.....	21

REFERENCES		23
-------------------	--	-----------

LIST OF TABLES

Table No.	Title	Page No.
3.1	Experimental Scheme for Dye Extraction	12

LIST OF FIGURES

Figure No.	Title	Page No.
2.1	Water/Oil/Water System.....	4
2.2	Nature of Surfactant.....	5
2.3	Extraction Mechanism-Type I.....	6
2.4	Extraction Mechanism-Type II.....	6
3.1	Structure of Span 80.....	7
3.2	Reaction Mechanism for Span 80.....	7
3.3	Structure of n-Hexane.....	8
3.4	Structure of Crystal Violet.....	9
3.5	Schematic Diagram of the Experimental Work.....	10
3.6	Calibration Curve for Crystal Violet.....	13
4.1	Effect of Span 80 on CV Extraction.....	15
4.2	Effect of NaOH Concentration on CV Extraction.....	16
4.3	Effect of n-Hexane on CV Extraction.....	17
4.4	Effect of Stirring Speed on CV Extraction.....	18
4.5	Effect of Feed Concentration on CV Extraction.....	20

ABBREVIATIONS

AI	Artificial Intelligence
AR	Autoregressive Model
ARMA	Auto regressive Moving Average Model
ARMAX	ARMA with external input
ARX	AR with external input
ASM1	Activated Sludge Model1
ASM2	Activated Sludge Model2
ASM3	Activated Sludge Model3
ASP	Activated Sludge Process
BOD	Biochemical Oxygen Demand
BSRT	Biological Solids Retention Time
COD	Chemical Oxygen Demand
DO	Dissolved Oxygen
F/M Ratio	Food to Microorganism Ratio
GA	Genetic Algorithm

NOTATIONS

K	Specific substrate utilization rate constant
k_d	Microbial decay coefficient
K_s	Substrate concentration when growth rate is half of maximum
Q	Rate of waste water flow to the aeration tank
q	Specific substrate utilization rate
Q_e	Effluent flow rate
q_m	Maximum specific substrate utilization rate
Q_r	Rate of recycle sludge
Q_w	Rate of sludge wasting from the reactor
R	Recirculation ratio
S	Residual growth limiting substrate concentration
S_0	Substrate concentration in the raw water
S_e	Steady state substrate concentration after treatment
V	Volume of the aeration tank
X	Biomass concentration in the Aeration tank

References

1. Papers with Single Author,

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

2. Papers with Two Authors,

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

3. Papers with 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. Books

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

QUICK REFERENCE

PAGEDIMENSIONSANDMARGIN

Paper size : 80gsm. StandardA4size (210mmX297 mm)

Margins

Top edge : 1 inch (25mm)

Left side : 1½ inch (38mm)

Bottom edge : 1 inch (25mm)

Right side : 1 inch (25mm)

Print out : Laserjet or Inkjet printer, **printed on both side**

Font size (regular Text) : TimesNewRomanof12pts

Spacing : 1.5 line spacing

Chapters : 14pts bold Centre aligned(Capital Letters)

Sections : 12 pts bold left aligned(Capital Letters)

Subsections : 12 pts bold left aligned (Title case)

Page numbers (Chapters) : Bottom–centered–12pts (1,2,3...)

Page numbers (Preliminaries): Bottom–centered–12pts/Roman numerals (i,ii,iii....)

Binding :Soft binding (edge with black color strip)

Number of copies

B.Tech. 4

(Candidate(as in dividual), Guide, Department, Examiner)