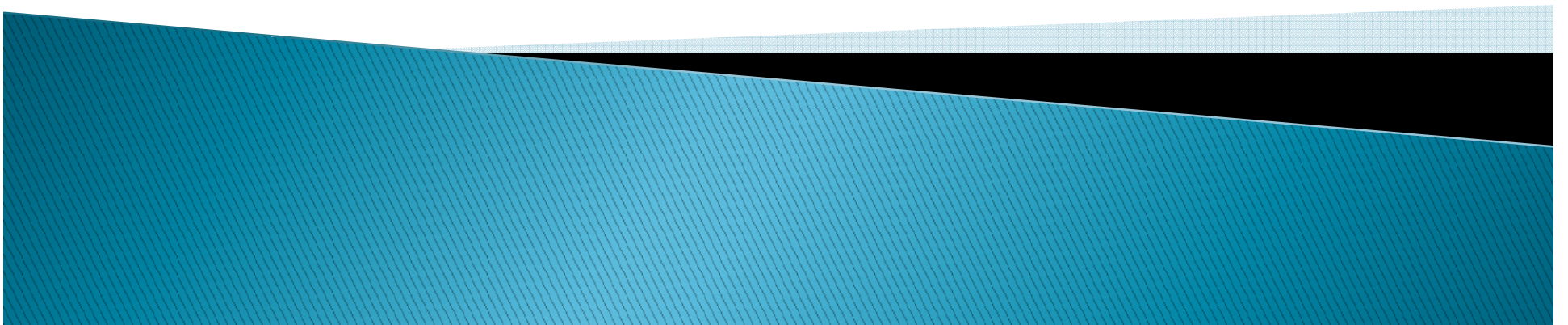
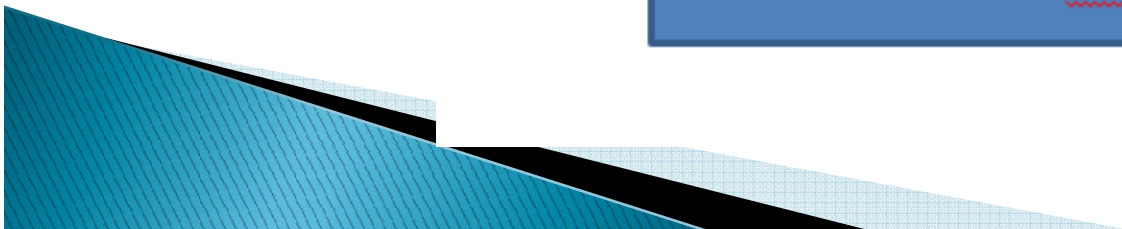
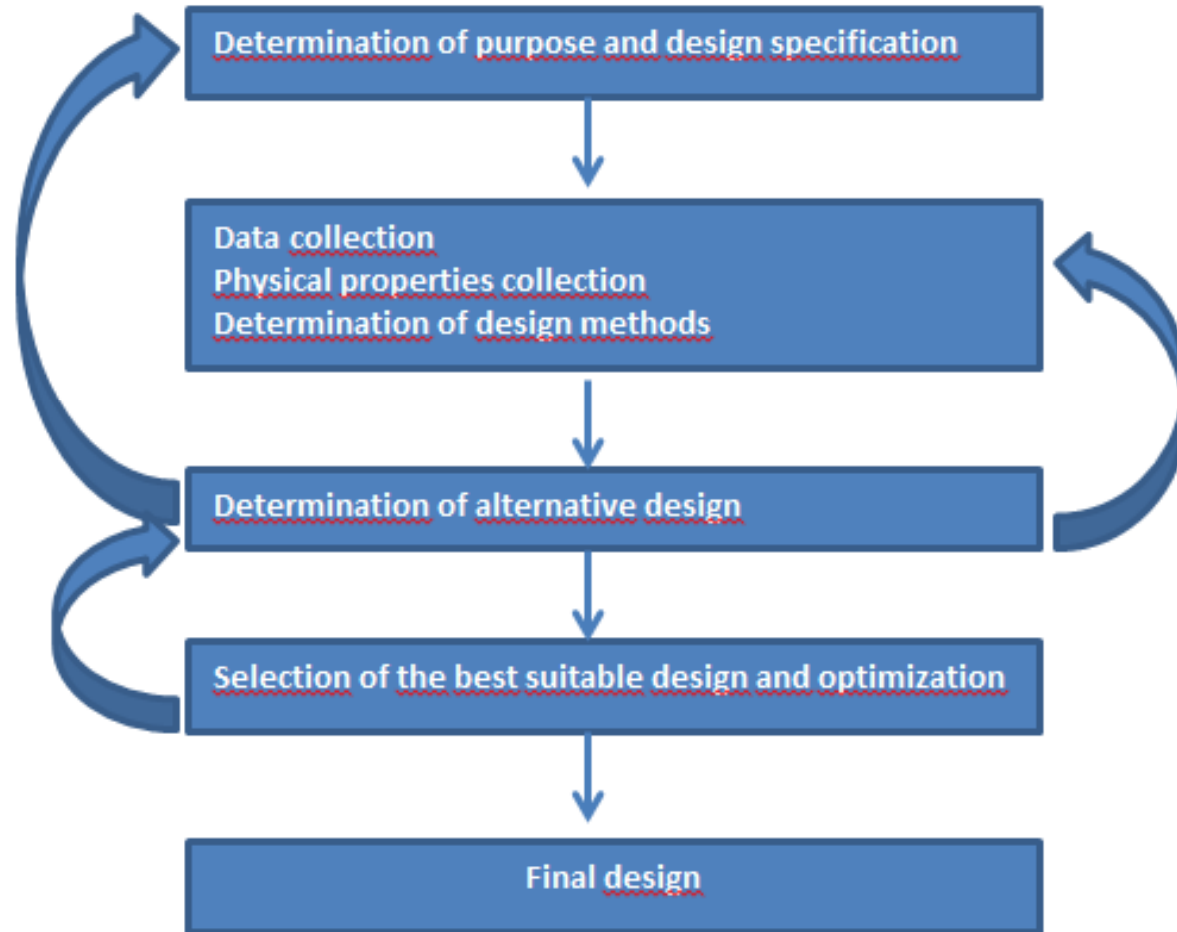


# FDE 401

# Process Design

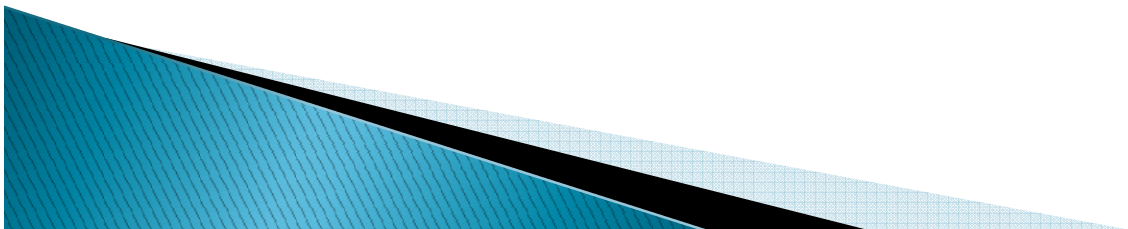


# DESIGN STAGES



# DESIGN STAGES

- ▶ In the initial step, it is clarified what the problem is.
- ▶ In this step, previous work and literature survey can be used .
- ▶ After that, creative solutions should be produced.
- ▶ The optimum solution should be selected by the team.
  - ▶ In this step, draft material and energy balances are used. And also an alternative way to reach the best design is searched. In the next step, a simple flow chart is prepared .
- ▶ Material and energy balance for the optimum design are constructed.



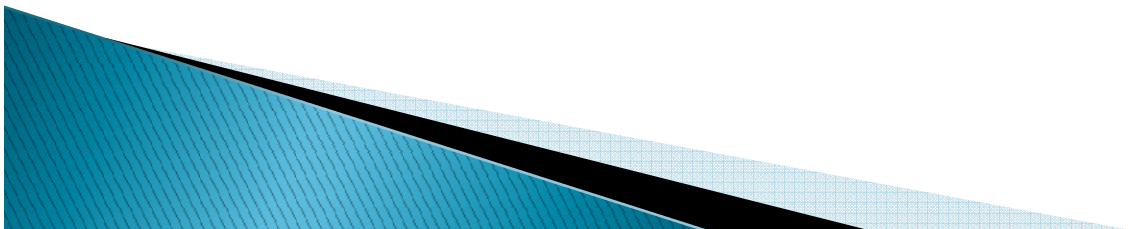
# DESIGN STAGES

- ▶ Equipments used in the design should be selected. During selection, the capability of the equipment to meet the system requirements should be checked.
- ▶ For example;
  - Distillation column: plate count, operating conditions, column diameter, material etc.
  - Reactor: catalyzer type, size, bed diameter and thickness, material etc.
  - Heat exchanger: plate count and size, avarage temperature difference, material etc.
  - Pump and compressors: power, pressure difference, viscosity etc.



# DESIGN STAGES

- ▶ In the next stage, a cost analysis should be performed, capital investment and product cost should be calculated.
- ▶ As a final step, design report is written.



# Design Report

## TITLE PAGE

- Includes title of report, name of person to whom the report is submitted, writer's name and organization, and date.

## TABLE OF CONTENTS

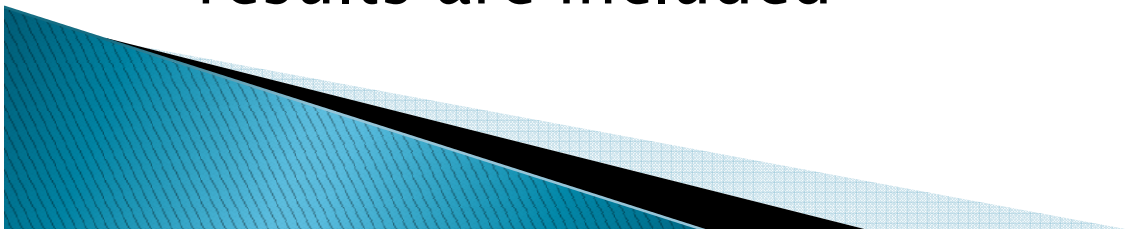
- Indicates all major sections and location and title of figures, tables .

## SUMMARY

- Briefly presents essential results and conclusions in a clear and precise manner

## I. INTRODUCTION

- Presents a brief discussion to explain what the report is about and the reason for the report; no results are included

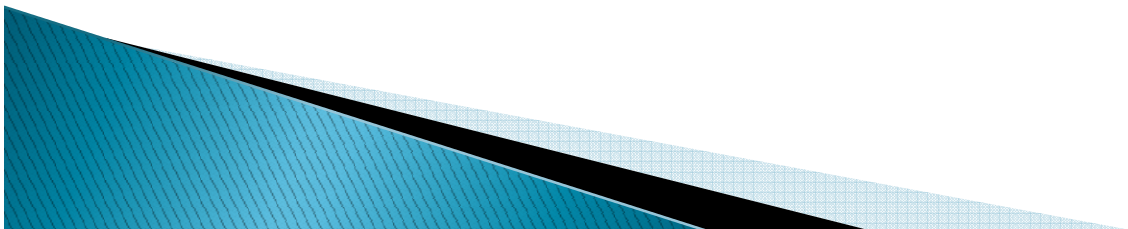


## II. PREVIOUS WORK

- ▶ Discusses important results obtained from literature surveys and other previous work

## III. DISCUSSION

- ▶ \*Outlines method of attack on the project
- ▶ \*Includes graphs, tables, and figures that are essential for understanding the discussion
- ▶ \*Discusses technical matters of importance
- ▶ \*Indicates assumptions made and the reasons
- ▶ \*Indicates possible sources of errors
- ▶ \*Gives a general discussion of results and proposed design



#### IV. RECOMMENDED DESIGN

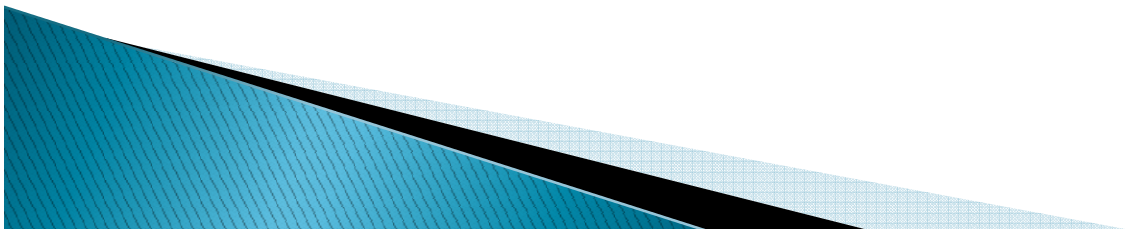
- ▶ Drawings of proposed design
  - \*Qualitative or quantitative or detailed flow sheets
- ▶ Tables Listing Equipment and Specifications
- ▶ Tables for Material and Energy Balances
- ▶ Process Economics
  - \*Costs, profits, and return on investment

#### V. CONCLUSIONS AND RECOMMENDATIONS

- ▶ Presented in more detail than in Summary

#### VI. ACKNOWLEDGEMENT

- ▶ Acknowledges important assistance of others who are not listed as preparing the report





## VII. TABLE OF NOMENCLATURE

Sample units should be shown

### ▶ VIII. REFERENCES

### ▶ IX. APPENDIX

#### ▶ IX.1. Sample Calculation

- ▶ \*One sample should be presented and explained clearly for each type of calculation

#### ▶ IX.2. Derivation of Equations

- ▶ \*Derivation of equations essential to understanding of the report but not presented in detail in the main body of the report

#### ▶ IX.3. Tables of Data

- ▶ \*Tables of data with reference to source

