TITLE HERE

A thesis report submitted in partial fulfilment of the requirements for the degree of

BE

In

Chemical Engineering

By

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DEPARTMENT OF CHEMICAL SCIENCE & ENGINEERING

SCHOOL OF ENGINEERING

KATHMANDU UNIVERSITY

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BONAFIDE CERTIFICATE

This is to certify that the project entitled **project topic** is a bonafide record of work done by

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in partial fulfilment of the requirements for the award of the degree of **Bachelor of Engineering** in **Chemical Engineering** of the **Kathmandu University, Dhulikhel** during the year 2024.

supervisor name	**HOD name**
Project Supervisor	Head of Department
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Internal Examination Committee	**external**
Department of Chemical Science & Engineering	External Examiner

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ABSTRACT

Abstract here

ACKNOWLEDGEMENTS

Write acknowledgement here

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CHAPTER 1 INTRODUCTION

1.1 Background

The production of synthesis gas (syngas), a versatile fuel and feedstock composed primarily of hydrogen (H2) and carbon monoxide (CO), is a critical process for the development of sustainable energy systems and the transition towards a circular bioeconomy [1].

Figure 1.1: Gasification process

CHAPTER 2 THEORETICAL BACKGROUND

This section is especially designed to provide the theoretical background for better understanding of the modeling approaches discussed in the thesis. It also discusses the machine learning and deep learning algorithms applied in the thesis. Moreover, it also discusses the single and multi objective optimization.

CHAPTER 3 METHODOLOGY

CHAPTER 4 RESULTS AND DISCUSSION

Table 4.1: Design parameter range

Design Parameter	**Range**
Temperature(K)	913.15-1123.15
Pressure(bar)	1-4
BMR	0.2-2

CHAPTER 5 CONCLUSION

In conclusion, this study provides a thorough strategy for improving the efficiency of the gasification process by utilizing modeling, data generation, machine learning, and evolutionary optimization techniques.

BIBLIOGRAPHY

[1] Yi Fang, Manosh C Paul, Sunita Varjani, Xian Li, Young-Kwon Park, and Siming You. Concentrated solar thermochemical gasification of biomass: Principles, applications, and development. *Renewable and Sustainable Energy Reviews*, 150:111484, 2021.