Report
On
Internship Training Programme
(OIP-2025)

Chemical Process Technology

Submitted in Partial Fulfilment of the Requirements for the mandatory Industrial Internship training Programme

Submitted by:

Aayush Kumar

Guru Ghasidas Vishwavidyalaya

Dates: 5th June to 15th July, 2025

Indian Institute of Chemical Engineers(IIChE)

Dr. H. L. Roy Building, Jadavpur University Campus,

188 Raja Subodh Chandra Mullick Road, Kolkata 700 032

www.iiche.org.in / iichehqfb@gmail.com/director.ti@iiche.org.in

Certificate from the IIChE

This is to certify that **Aayush Kumar** from **GURU GHASIDAS VISHWAVIDYALAYA** successfully completed online summer internship programme in our organization. The matter embodied in this report is a genuine to the best of our knowledge and belief and has not been submitted before, neither to this Institute nor to any other organization for the fulfilment of the requirement of any course of study. During her internship tenure in IIChE, we found her as a hardworking, sincere, and diligent person and her behaviour and conduct was good. We wish her all the best for her future endeavour.

Chief Coordinator, OIP-2025

OIP-2025

Preface

Objectives of Online Internship Program

- Assist the student's development of employer-valued skills such as teamwork, communications and attention to learn Engineer's responsibilities and ethics.
- Enhance and/or expand the student's knowledge of a particular area(s) of skill.
- Expose the student to professional role models or mentors who will provide the student with support in the early stages of the internship and provide an example of the behaviours expected in the intern's workplace.
- To familiarize with various materials, processes, products and their applications along with relevant aspects of technology and troubleshooting.
- To gain experience in writing technical report/project.

Course Outcome

- Provides basic idea of different real life industrial processes, problems, trouble shooting, decision making and preventive maintenance techniques and professional culture of industry, work ethics and attitudes in industry. The different live situation, trouble shooting and modern technological application.
- Provides course materials to the students for reference (in PDF format). The study materials have been shared with the students through IIChE for its record.
- Improves to deal with the assignments which has been given for the solution / conceptual ideas based on discussion during the tutorial class.
- Helps to understand the importance of the application of modern tools for the industrial automation / up-gradation / scale-up.
- Develops conceptual theory in the regular class room discussion and its application in real-life industrial problem resolution.
- Gives primary idea to analyse Case studies based on real life application.

SUMMER TRAINING REPORT

AT

NATIONAL THERMAL POWER CORPORATION (SIPAT)

ON

WATER CHEMISTRY FOR POWER PLANT WITH SPECIFIC REFERENCE TO SUPERCRITICAL BOILER

(June 2025-July 2025)

(SUBMITTED BY)

ABHISHEK KUMAR

(ROLL NUMBER: 22021103)

(ENROLLMENT NUMBER: GGV/22/01503)

(2025-26)

Department of Chemical engineering

GURU GHASIDAS VISHWAVIDYALAYA

BILASPUR (C.G.) 495009

(A Central Universities established by Central Universities Act, 2009)

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1. ABSTRACT

Water chemistry plays a critical role in ensuring the efficiency, safety, and longevity of power plant operations, particularly in supercritical boilers used in modern thermal power plants like NTPC Sipat Super Thermal Power Station. Supercritical boilers operate at high temperatures and pressures, necessitating stringent water quality to prevent corrosion, scaling, and fouling in boiler tubes and turbine system. This report explores the significance of maintaining the key parameters of water such as pH, dissolved oxygen, and conductivity to enhance thermal efficiency downtime. Emphasis is placed on the unique challenges posed by supercritical boiler systems, including the need of ultra-pure water to withstand extreme operating conditions and implementation of advanced treatment process like AVT (All Volatile Treatment), OT (Oxygenated Treatment), Phosphate Treatment, demineralisation and chemical dosing. By analysing the water chemistry practises at NTPC Sipat, which sources water from the Hasdeo River, this study highlights the critical relationship between water quality and operational performance, underscoring the importance of robust water management strategies in achieving sustainable and efficient power generation.

Training Certificate

REGIONAL LEARNING INSTITUTE, NTPC, SIPAT
क्षेत्रीय ज्ञानार्जन संस्थान, एनटीपीसी, सीपत
CERTIFICATE OF VOCATIONAL TRAINING - 2025
व्यावसायिक प्रशिक्षण प्रमाण पत्र - 2025

THE CERTIFICATE IS AWARDED TO
ABHISHEK KUMAR
VT Roll No -VT25CHEM006
Branch - CHEMICAL ENGINEERING
Name of College/Institute - GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

For satisfactorily completing **Vocational Training at NTPC, Sipat, Bilaspur** for a period of four weeks from 16/06/2025 to 15/07/2025. The participant has successfully completed the course and has also completed the project assigned to him/her as part of this course. We wish him/her a bright and successful future.

DATE -19/07/2025
Ref No. RLI/SIPAT/VT/CERT/2025/VT25CHEM006

Nakka Ramesh
Sr. Manager (RLI)

KV Prasad
GM & Head (RLI-Simulator)

FUEL FROM WASTE PLASTIC

A Project Report

In Fulfilment of the Requirement for Award of Degree of

Bachelor of Technology of the 3rd Year in Chemical Engineering

Submitted By

Abhishek Singh (22021104)

Under the Guidance of

Dr. Prateek Khatri

Assistant Professor

DEPARTMENT OF CHEMICAL ENGINEERING

NATIONAL INSTITUTE OF TECHNOLOGY, ROURKELA (ODISHA)

July 2025

CERTIFICATE

Certified that the Major Project Report entitled ***"FUEL FROM WASTE PLASTIC"*** submitted by Abhishek Singh & Vineet Yadav of B.Tech. 7th Semester, in partial fulfillment of the requirements for the award of degree in Bachelor of Technology (B. Tech) in Chemical Engineering, is according to the students their own investigation carried out by them in the Department of Chemical Engineering, School of Studies of Engineering & Technology, GGV, during the session 2025-26.

Dr. Amit Jain
HoD
Department of Chemical Engineering
SoS of Engineering & Technology, GGV

Dr. Prateek Khatri
Supervisor
Department of Chemical Engineering
National Institute of Technology, Rourkela

ABSTRACT

Plastic waste poses a significant environmental challenge due to its non-biodegradable nature and increasing accumulation. This project explores the conversion of waste plastic into valuable fuel through the process of pyrolysis, a thermochemical decomposition method conducted in an oxygen-free environment at elevated temperatures. The main objective is to address the dual issues of plastic pollution and energy demand by transforming commonly discarded plastics such as polypropylene (PP) and polyethylene (PE) into liquid fuel, gas, and char. The experimental setup involves shredding, cleaning, and feeding plastic waste into a reactor, followed by heating to temperatures between 300–500°C. The resulting vapors are condensed to yield oil, which exhibits properties similar to conventional diesel. The process not only reduces plastic waste but also produces a cost-effective and sustainable alternative fuel, with potential for broad industrial and commercial application[2][6][8].

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NATIONAL THERMAL POWER CORPORATION (SIPAT)

ON

WATER CHEMISTRY FOR POWER PLANT WITH SPECIFIC REFERENCE TO SUPERCRITICAL BOILER

(June 2025-July 2025)

(SUBMITTED BY)

ADARSH KUMAR

(ROLL NUMBER: 22021105)

(ENROLLMENT NUMBER: GGV/22/01505)

(2025-26)

Department of Chemical Engineering

GURU GHASIDAS VISHWAVIDYALAYA

BILASPUR (C.G.) 495009

(A Central University established by Central Universities Act, 2009)

CONTENT

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CERTIFICATE OF VOCATIONAL TRAINING - 2025
व्यावसायिक प्रशिक्षण प्रमाण पत्र - 2025

THE CERTIFICATE IS AWARDED TO

ADARSH KUMAR

VT Roll No -VT25CHEM042

Branch - CHEMICAL ENGINEERING

Name of College/Institute - GURU GHASIDAS VISHWAVIDYALAYA,BILASPUR

For satisfactorily completing **Vocational Training at NTPC, Sipat, Bilaspur** for a period of four weeks from 16/06/2025 to 15/07/2025. The participant has successfully completed the course and has also completed the project assigned to him/her as part of this course. We wish him/her a bright and successful future.

DATE -19/07/2025

Ref No. RLI/SIPAT/VT/CERT/2025/VT25CHEM042

Nakka Ramesh
Sr. Manager (RLI)

KV Prasad
GM & Head (RLI-Simulator)

A

Internship Report

Submitted in partial fulfillment of the requirement of the degree of Bachelor Of Technology of the 4th Year

In

Chemical Engineering

Submitted by

Name	RollNo.
Adarsh P	22021106

DEPARTMENT OF CHEMICAL ENGINEERING

School Of Studies Engineering & Technology

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central University Established By The Central University Act 2009 No. 25 of 2009)

July 2025

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CERTIFICATE OF VOCATIONAL TRAINING - 2025
व्यावसायिक प्रशिक्षण प्रमाण पत्र – 2025

THE CERTIFICATE IS AWARDED TO

ADARSH.P

VT Roll No - VT25CHEM016

Branch – CHEMICAL ENGINEERING

Name of College/Institute - GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

For satisfactorily completing Vocational Training at NTPC, Sipat, Bilaspur for a period of four weeks from 16/06/2025 to 15/07/2025. The participant has successfully completed the course and has also completed the project assigned to him/her as part of this course. We wish him/her a bright and successful future.

Nakka Ramesh
Sr. Manager (RLI)

KV Prasad
GM & Head (RLI-Simulator)

Ref No. RLI/SIPAT/VT/CERT/2025/VT25CHEM016

GURU GHASIDAS VISHWAVIDYALAYA
BILASPUR - 495009

Summer Internship Report

Internship From NTPC Sipat

On

Water Chemistry For Power Plants: with specific References
Supercritical Boilers

Submitted by

Ajay Ghildiyal (22021107)

Guided by

Mr. Nakka Ramesh

DEPARTMENT OF CHEMICAL ENGINEERING
School Of Studies Engineering & Technology
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A Central University Established By The Central University Act 2009 No. 25 of 2009)

July 2025

REGIONAL LEARNING INSTITUTE, NTPC, SIPAT
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CERTIFICATE OF VOCATIONAL TRAINING - 2025
व्यावसायिक प्रशिक्षण प्रमाण पत्र - 2025

THE CERTIFICATE IS AWARDED TO

AJAY GHILDIYAL

VT Roll No -VT25CHEM010

Branch - CHEMICAL ENGINEERING

Name of College/Institute - GURU GHASIDAS VISHWAVIDYALAYA,BILASPUR

For satisfactorily completing **Vocational Training at NTPC, Sipat, Bilaspur** for a period of four weeks from 16/06/2025 to 15/07/2025. The participant has successfully completed the course and has also completed the project assigned to him/her as part of this course. We wish him/her a bright and successful future.

DATE -19/07/2025

Ref No. RLI/SIPAT/VT/CERT/2025/VT25CHEM010

Nakka Ramesh
Sr. Manager (RLI)

KV Prasad
GM & Head (RLI-Simulator)

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GURU GHASHIDAS VISHWAVIDYALAYA

BILASPUR– 495009

Summer Internship Report

Internship Done in:

INDIAN INSTITUTE OF TECHNOLOGY

(BHU) VARANASI– 221005

On

Assessment of Particulate Matter (PM_{10}, $PM_{2.5}$, PM_1) concentration and its Health-Relevant Oxidative Potential

Name: Akshat Pandey

Roll No.: 22021108

Branch: Chemical Engineering

Semester: - 7th

Guided By: - Prof R S Singh

Internship Duration: 10th May 2025 to 12th July 2025

Department of Chemical Engineering & Technology

INDIAN INSTITUTE OF TECHNOLOGY (BHU)

VARANASI-221005

CERTIFICATE

This is to certify that, project entitled "Assessment of Particulate Matter (PM_{10}, $PM_{2.5}$, PM_1) concentration and its Health-Relevant Oxidative Potential" has been prepared and submitted by Mr. Akshat Pandey. He successfully completed a report on training on Oxidative Potential using DTT assay from the 10 May to 12 July 2025. His performance for this program was satisfactory. He has undergone fair exposure of Bioremediation, processing analysis, and report preparation.

Dr. Ram Sharan
Singh (Supervisor)
Department of Chemical Engineering & Technology
IIT (B.H.U.), Varanasi

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भारतीय प्रौद्योगिकी संस्थान
काशी हिन्दू विश्वविद्यालय
IIT
INDIAN INSTITUTE OF TECHNOLOGY
BANARAS HINDU UNIVERSITY
Serving the nation since 1919

प्रशिक्षण एवं प्रस्थापना प्रकोष्ठ TRAINING AND PLACEMENT CELL
VARANASI-221 005
Phone: (0542) 7165958, 7165959 Website : placement.iitbhu.ac.in E-mail: tpo@iitbhu.ac.in

No. : 4233

TRAINING CERTIFICATE

Name of the Student ... Akshat Pandey
Father's Name .. Mr. Ajay Kumar Pandey Mother's Name .. Mrs. Shail Pandey
Name of the Institute/College ... Guru Ghashidas Vishwavidyalaya
Course .. B.Tech ..... Branch .. Chemical Eng. ..... Semester ... 7th

Week / Month	Date		Actual working days put in	Remarks	Signature of the Supervisor
	From	To			
1st	17/05/2025	18/05/2025	02	SATISFACTORY	
2nd	19/05/2025	25/05/2025	06	— Do —	
3rd	26/05/2025	01/06/2025	06	— Do —	
4th	02/06/2025	08/06/2025	06	— Do —	
5th	09/06/2025	15/06/2025	06	— Do —	
6th	16/06/2025	22/06/2025	06	— Do —	
7th	23/06/2025	29/06/2025	06	— Do —	
8th	30/06/2025	11/07/2025	11	— Do —	

Conduct ..... The candidate is hardworking, sincere and dedicated.
Other remarks, if any .. He completed the assigned work successfully.

11/7/25
Signature of Head of the Department/ Coordinator of the School
(with Seal)
विभागाध्यक्ष/Head
रासायनिक अभियान्त्रिकी एवं प्रौद्योगिकी विभाग
Dept. of Chemical Engineering & Technology
भारतीय प्रौद्योगिकी संस्थान (का.हि.वि.) वाराणसी
Indian Institute of Technology (BHU) Varanasi
वाराणसी / Varanasi-221005

11/7/25
Coordinator
Training and Placement Cell
(with Seal)
समन्वयक/Coordinator
प्रशिक्षण एवं प्रस्थापना प्रकोष्ठ
Training and Placement Cell
भारतीय प्रौद्योगिकी संस्थान (का.हि.वि.)
Indian Institute of Technology (BHU)
वाराणसी/Varanasi -221005
S.Dubey

Project report

on

Determination of system head for Overhead Storage Tank new makeup line towards optimising pump size

Prepared by	Amisha Kumari Ms. Amisha Kumari
Checked by	27.6.24 Pankaj P. Bhuse, PESS, RRSD, RG, BARC
Issued by	Vivek Mishra Vivek Mishra, Head PESS, RRSD, RG, BARC

विवेक मिश्रा / Vivek Mishra
अध्यक्ष, पीईएसएस, आरआरएसडी / Head, PESS, RRSD
भारत सरकार / Government of India
भाभा परमाणु अनुसंधान केन्द्र / BARC
ट्रांबे, मुंबई / Trombay, Mumbai - 400085

Bhabha Atomic Research Centre
Research reactor Services Division
Performance Evaluation and Safety Section

CERTIFICATE OF PROJECT COMPLETION

This is to certify that Ms Amisha Pandey, 3rd year chemical engineering student from Guru Ghasidas Vishwavidyalaya, Bilaspur has successfully completed her project work on "**Determination of system head for Overhead Storage Tank new makeup line towards optimising pump size"** under my guidance from dated 15th May 2025 to 30th June 2025.

We wish her the best wishes for her future endeavours.

27/6/25

Shri. Shibu Thomas
Head, Research reactor Services Division

शिबू थॉमस / SHIBU THOMAS
अध्यक्ष, आरआरएसडी / Head, RRSD
भारत सरकार / Government of India
भाभा परमाणु अनुसंधान केंद्र / BARC
ट्रॉम्बे, मुंबई / Trombay, Mumbai - 400 085

Shri. Vivek Mishra,
Project Guide
Head, PESS, Research reactor Services Division

विवेक मिश्रा / Vivek Mishra
अध्यक्ष, आरआरएसडी / Head, PESS, RRSD
भारत सरकार / Government of India
भाभा परमाणु अनुसंधान केंद्र / BARC
ट्रॉम्बे, मुंबई / Trombay, Mumbai - 400085

Abstract

Dhruva is a 100 MW research reactor. It has three cooling stages to extract the heat from the reactor core during its operation and for decay heat removal during reactor shutdown. It uses heavy water as primary heat transport medium to safely remove heat and maintain reactor performance. Demineralised light water, used in secondary cooling loop receives heat from heavy water through intermediate heat exchangers. The heat from the secondary loop is transferred to sea water as UHS.

Dhruva has Over Head Storage Tank (OHST) and Underground Dump tank. Cooling water flows from OHST to dump tank after decay heat removal. To ensure continuous cooling, water from dump tank is pumped back to Overhead tank to make up the water level in OHST. It consists of two pipelines of sizes, 250 mm & 150 mm, two centrifugal pumps along with necessary valves and fittings.

Recently new makeup line has been installed and commissioned. It was observed that the desired flow of 3600 lpm is obtained by throttling discharge valves of pumps which is indicative of oversizing of piping. This project work is aimed to determine system head for the flowrate of 3600 lpm and to optimize pump sizing for the same.

The project work covers the detailed analysis of makeup line for the determination of length of pipeline, comprehensive hydraulic calculation, considering flow velocity, Reynolds number, friction factor using the Swamee-Jain equation, and resulting head loss at different flow rates. **The analysis clearly indicates that the system head is 46 m against desired flow of 3600 lpm. For our desired flow of 3600 lpm and head of 46 m, it is validated that system head curve intersects with the pump performance curve for the impeller diameter of 380 mm.**

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GURU GHASIDAS VISHWAVIDYALAYA
BILASPUR - 495009

Summer Internship Report

Internship From NTPC Sipat

On

How To Achieve Zero Liquid Discharge In Power Plant

Submitted by

Ankit Raj (22021110)

Guided by

Mr. Nakka Ramesh

DEPARTMENT OF CHEMICAL ENGINEERING
School Of Studies Engineering & Technology
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A Central University Established By The Central University Act 2009 No. 25 of 2009)

July 2025

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व्यावसायिक प्रशिक्षण प्रमाण पत्र – 2025

THE CERTIFICATE IS AWARDED TO

ANKIT RAJ

VT Roll No - VT25CHEM018

Branch – CHEMICAL ENGINEERING

Name of College/Institute - GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

For satisfactorily completing Vocational Training at NTPC, Sipat, Bilaspur for a period of four weeks from 16/06/2025 to 15/07/2025. The participant has successfully completed the course and has also completed the project assigned to him/her as part of this course. We wish him/her a bright and successful future.

Ref No. RLI/SIPAT/VT/CERT/2025/VT25CHEM018

Nakka Ramesh
Sr. Manager (RLI)

KV Prasad
GM & Head (RLI-Simulator)

OIL AND NATURAL GAS CORPORATION LTD.

CBM ASSET

1st Floor, H.S.C.L. Building Near Naya More, Bokaro-827001

This is to certify that ~~Mr./Ms.~~ ANKUR KUMAR a student of GURU GHASIDAS VISWAVIDYALAYA BILASPUR (C.G.)

has undergone Summer / ~~Winter~~ / Industrial Training at ONGC from 13.05.2025 to 27.06.2025

~~He/She~~ has successfully completed his / ~~her~~ Project Work on "CBM GAS PROCESSING & CO_2 REMOVAL SYSTEM" in discipline of B.TECH.(CHEM. ENGG.) during the Training, he/~~she~~ took keen interest in the assigned work.

We wish him/her all success in his/~~her~~ academic endeavours and life.

CGM (HR)-Head HR

Date : 27/06/2025

Place : Bokaro

ONGC CBM ASSET, BOKARO

Summer Industrial Training Report on

"CBM GAS PROCESSING AND CO_2 REMOVAL SYSTEM"

(13.05.2025 - 27.06.2025)

ANKUR KUMAR
GGV/22/01511
CHEMICAL ENGINEERING

SCHOOL OF STUDIES OF ENGINEERING AND TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALYA, BILSAPUR (C.G), 495009

TRAINEE DETAILS

Submitted to:

NAME	REKHA GORAI
POST	EE (PRODUCTION)
ORGANIZATION	ONGC, CBM ASSET BOKARO

Performed by:

NAME	ANKUR KUMAR
COLLEGE	GURU GHASIDAS VISWAVIDYALAYA, BILASPUR (C.G)
ROLL NO.	GGV/22/01511
BRANCH	CHEMICAL ENGINEERING
YEAR/ SEMESTER	3rd YEAR/ 6th SEM
REPORT TITLE	CBM GAS PEOCESSING AND CO_2 REMOVAL SYSTEM
DURATION	13.05.25 – 27.06.25

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GURU GHASIDAS VISHWAVIDYALAYA
BILASPUR - 495009

Summer Internship Report

Internship From NTPC SIPAT

On

HOW TO ACHIEVE ZERO LIQUID DISCHARGE IN POWER PLANTS

Submitted by

Anwar Sahil Ali (22021112)

Guided by

Mr. Nakka Ramesh

DEPARTMENT OF CHEMICAL ENGINEERING
School Of Studies Engineering & Technology
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A Central University Established By The Central University Act 2009 No. 25 of 2009)

July 2025

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व्यावसायिक प्रशिक्षण प्रमाण पत्र - 2025

THE CERTIFICATE IS AWARDED TO

ANWAR SAHIL ALI

VT Roll No -VT25CHEM022

Branch - CHEMICAL ENGINEERING

Name of College/Institute - GURU GHASIDAS VISHWAVIDYALAYA,BILASPUR

For satisfactorily completing **Vocational Training at NTPC, Sipat, Bilaspur** for a period of four weeks from 16/06/2025 to 15/07/2025. The participant has successfully completed the course and has also completed the project assigned to him/her as part of this course. We wish him/her a bright and successful future.

DATE -19/07/2025

Ref No. RLI/SIPAT/VT/CERT/2025/VT25CHEM022

Nakka Ramesh
Sr. Manager (RLI)

KV Prasad
GM & Head (RLI-Simulator)

GURU GHASIDAS VISHWAVIDYALAYA

BILASPUR - 495009

Summer Internship Report

Internship From NTPC Sipat

On

Water Chemistry For Power Plants: with specific Reference to Supercritical Boilers

Submitted by

Aryan Singh (22021113)

Guided by

Mr. Nakka Ramesh

DEPARTMENT OF CHEMICAL ENGINEERING
School Of Studies Engineering & Technology
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A Central University Established By The Central University Act 2009 No. 25 of 2009)

July 2025

REGIONAL LEARNING INSTITUTE, NTPC, SIPAT
क्षेत्रीय ज्ञानार्जन संस्थान, एनटीपीसी, सीपत
CERTIFICATE OF VOCATIONAL TRAINING - 2025
व्यावसायिक प्रशिक्षण प्रमाण पत्र – 2025

THE CERTIFICATE IS AWARDED TO

ARYAN SINGH

VT Roll No - VT25CHEM013

Branch – CHEMICAL ENGINEERING

Name of College/Institute - GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

For satisfactorily completing Vocational Training at NTPC, Sipat, Bilaspur for a period of four weeks from 16/06/2025 to 15/07/2025. The participant has successfully completed the course and has also completed the project assigned to him/her as part of this course. We wish him/her a bright and successful future.

Ref No. RLI/SIPAT/VT/CERT/2025/VT25CHEM013

Nakka Ramesh
Sr. Manager (RLI)

KV Prasad
GM & Head (RLI-Simulator)

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GURU GHASIDAS VISHWAVIDYALAYA
BILASPUR (C.G.)

सेल SAIL

A

PROJECT REPORT

ON

"Ammonia Recovery and Slippage Mitigation in Coke Oven Gas Treatment: A Comparative Study and Major to Reduce it"

Submitted in partial fulfilment of the requirement for the award of

BACHELOR OF TECHNOLOGY

IN

CHEMICAL ENGINEERING

Guided by:

Mr. Anand Shukla

GM, CO & CCD

Submitted by:

Astha Agrawal

(22021114)

DEPARTMENT OF CHEMICAL ENGINEERING
School Of Studies Engineering & Technology
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A Central University Established By The Central University Act 2009 No. 25 of 2009)

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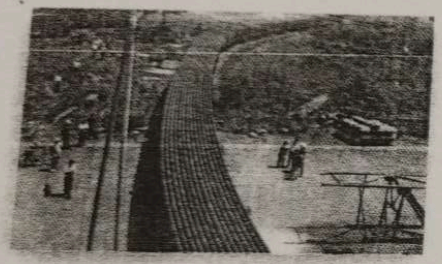
सेल SAIL

भिलाई इस्पात संयंत्र
BHILAI STEEL PLANT

मानव संसाधन विकास विभाग
HUMAN RESOURCES DEVELOPMENT DEPARTMENT

प्रमाणपत्र
CERTIFICATE



पंजीयन क्र.
Regn. No. *P-25/5325*

प्रमाणित किया जाता है कि श्री / कुमारी
This is to certify that Shri / Ku. ***Astha Agrawal***

सेमेस्टर विद्यार्थी — कालेज / संस्थान
..Sixth..... Sem., student of .....B.Tech..... (Chemical) of .....GGV, Bilaspur..... College / Institute

ने अवकाश कालीन प्रशिक्षु के रूप में दिनांक से तक प्रशिक्षण प्राप्त किया ।
has undergone project based training from ***09/06/2025*** **to** ***05/07/2025***

प्रोजेक्ट
Project . ***Report on "Ammonia recovery and slippage mitigation in coke oven gas treatment: A comparative study and major to reduce it"***

इस अवधि में उनका कार्य निष्पादन रहा ।
His / her performance during the training period has been ***Excellent***

प्रभारी (प्रशिक्षण)
Incharge (Training)
सुष्मिता पात्रा / Sushmita Patra
SAIL (BSP)

भिलाई, दिनांक
Bhilai, Dated..... ***05/07/2025***

NTPC SIPAT SUMMER INTERNSHIP REPORT

A Project Report: -

In Partial Fulfilment of the Requirement for Award of Degree of Bachelor of Technology of the 4th Year in Chemical Engineering

Submitted By: -

Bishal Sahani (22021116)

Under the Guidance of: -

Mr. Nakka Ramesh

Vocational Training 2025 NTPC Sipat Thermal Power Station

DEPARTMENT OF CHEMICAL ENGINEERING

SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

JULY 2025

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CERTIFICATE OF VOCATIONAL TRAINING - 2025
व्यावसायिक प्रशिक्षण प्रमाण पत्र – 2025

THE CERTIFICATE IS AWARDED TO

BISHAL SAHANI

VT Roll No - VT25CHEM035

Branch – CHEMICAL ENGINEERING

Name of College/Institute - GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

For satisfactorily completing Vocational Training at NTPC, Sipat, Bilaspur for a period of four weeks from 16/06/2025 to 15/07/2025. The participant has successfully completed the course and has also completed the project assigned to him/her as part of this course. We wish him/her a bright and successful future.

Ref No. RLI/SIPAT/VT/CERT/2025/VT25CHEM035

Nakka Ramesh
Sr. Manager (RLI)

KV Prasad
GM & Head (RLI-Simulator)

SAIL, IISCO STEEL PLANT, BURNPUR, WEST BENGAL

Summer Industrial Training Report on

"Blast Furnace Coke properties and the influence on Off-gas Dust"

(19.05.2025 - 14.06.2025)

BUNTY KUMAR RAJAK
GGV/22/01517
CHEMICAL ENGINEERING

SCHOOL OF STUDIES OF ENGINEERING AND TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALYA, BILSAPUR (C.G), 495009

स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड
STEEL AUTHORITY OF INDIA LIMITED
इस्को इस्पात संयंत्र
IISCO STEEL PLANT
मानव संसाधन-ज्ञानार्जन एवं विकास केन्द्र
HR-LEARNING & DEVELOPMENT CENTRE

Ref. No. : HR- L&D/ 2025/576 Date : 14.06.2025

This is to certify that

Shri Bunty Kumar Rajak

Student of

B. Tech. (Chemical)

Guru Ghasidas Vishwavidyalaya, Bilaspur

has undergone Industrial Training at our Works from 19-05-2025 to 14-06-2025

During the training period, he/she has been given exposure to various processes in major shops like Coke Ovens, Sinter plant, Blast Furnace, Basic Oxygen Furnace, Continuous Casting plant, Mills & other Allied maintenance / services.

His/Her attendance was regular and conduct was found to be satisfactory.

We wish him/her success in all future endeavours.

Training Coordinator 14/06/25

Head of HR-L&D 14/6/25

CONTENT

GURU GHASIDAS VISHWAVIDYALAYA

BILASPUR - 495009

Summer Training Report

On

"How to achieve zero liquid discharge in power plants"

At

NATIONAL THERMAL POWER CORPORATION LIMITED SIPAT

Submitted by

Dimpal Gautam (22021118)

Guided by

Mr. Nakka Ramesh

DEPARTMENT OF CHEMICAL ENGINEERING

School Of Studies Engineering & Technology

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central University Established By The Central University Act 2009 No. 25 of 2009)

July 2025

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व्यावसायिक प्रशिक्षण प्रमाण पत्र - 2025

THE CERTIFICATE IS AWARDED TO

DIMPAL GAUTAM

VT Roll No -VT25CHEM021

Branch - CHEMICAL ENGINEERING

Name of College/Institute - GURU GHASIDAS VISHWAVIDYALAYA,BILASPUR

For satisfactorily completing **Vocational Training at NTPC, Sipat, Bilaspur** for a period of four weeks from 16/06/2025 to 15/07/2025. The participant has successfully completed the course and has also completed the project assigned to him/her as part of this course. We wish him/her a bright and successful future.

DATE -19/07/2025

Ref No. RLI/SIPAT/VT/CERT/2025/VT25CHEM021

Nakka Ramesh
Sr. Manager (RLI)

KV Prasad
GM & Head (RLI-Simulator)

Nickel-supported mixed metal oxides catalyst for Dry Reforming of Methane

An Internship Report

In Partial Fulfilment of the Requirement for Award of Degree of

Bachelor of Technology of the 4th Year in Chemical Engineering

Submitted By

Janhavi Patel (22021119)

Under the Guidance of

Dr. Prateek Khatri

Assistant Professor

DEPARTMENT OF CHEMICAL ENGINEERING

SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

July 2025

ABSTRACT

The rapid growth of the global population and ongoing socioeconomic development have significantly increased worldwide energy demands, leading to a surge in fossil fuel usage and a consequential rise in greenhouse gas emissions. These emissions, primarily composed of stable and hazardous gases like CO_2 and CH_4, are major contributors to pressing environmental problems such as global warming, unpredictable weather patterns, and the loss of biodiversity. In response to these challenges, the dry reforming of methane (DRM) presents a promising strategy by converting greenhouse gases into valuable syngas. However, DRM's highly endothermic nature and tendency for side reactions pose considerable catalytic challenges.

This study investigates the performance of a nickel-based catalyst supported on a ceria–magnesia (CeO_2-MgO) mixed oxide for the DRM process. The catalyst, containing 15 wt% Ni, was synthesized via coprecipitation of the support and subsequent impregnation of nickel. Ammonia was used as the precipitating agent for the support preparation. The resulting catalyst was thoroughly characterized using X-ray diffraction (XRD), and BET surface area analysis. Our findings focus on how the combined use of CeO_2 and MgO as support materials enhances the catalyst's performance, specifically at lower DRM reaction temperatures, offering a viable approach to efficient syngas production while addressing environmental concerns related to greenhouse gas emissions.

NATIONAL INSTITUTE OF TECHNOLOGY ROURKELA

CERTIFICATE

OF COMPLETION

This Certificate is Awarded to

Janhavi Patel

Guru Ghasidas Vishwavidyalaya

has successfully completed summer internship program in

Chemical Engineering

Conducted from 16th May to 16th June 2025
at Department of Chemical Engineering, NIT Rourkela

Date: 16/06/2025

Dr. Prateek Khatri
Assistant Professor
Department of Chemical Engineering
National Institute of Technology Rourkela

Prof. Prateek Khatri
Supervisor

GURU GHASHIDAS VISHWAVIDYALAYA

BILASPUR– 495009

Summer Internship Report

Internship Done in:

NTPC SIPAT

On

Demineralization of water in power plants

Name: Jitesh Meher

Roll No.: 22021120

Branch: Chemical Engineering

Semester:- 7th

Guided By:- Mr. Nakka Ramesh

Internship Duration: 16th June 2025 to 15th July 2025

REGIONAL LEARNING INSTITUTE, NTPC, SIPAT
क्षेत्रीय ज्ञानार्जन संस्थान, एनटीपीसी, सीपत
CERTIFICATE OF VOCATIONAL TRAINING - 2025
व्यावसाययक प्रयिक्षण प्रमाण पत्र – 2025

THE CERTIFICATE IS AWARDED TO

JITESH MEHER

VT RollNo - VT25CHEM050

Branch – CHEMICAL ENGINEERING

Name of College/Institute - GURUGHASIDASVISHWAVIDYALAYA, BILASPUR

For satisfactorily completing Vocational Training at NTPC, Sipat, Bilaspur for a period of four weeks from 16/06/2025 to 15/07/2025. The participant has successfully completed the course and has also completed the project assigned to him/her as part of this course. We wish him/her a bright and successful future.

Ref No. RLI/SIPAT/VT/CERT/2025/VT25CHEM050

Nakka Ramesh
Sr. Manager (RLI)

KV Prasad
GM&Head (RLI-Simulator)

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A Project Report

On

An Overview of the

Viscose Plant

Submitted By

Kashish Sain

Under the Guidance of

Shivaji Patil

General Manager

ADITYA BIRLA

GRASIM

Grasim Industries Limited,

part of the Aditya Birla Group,

ranks amongst the top publicly listed companies in India

June 2025

INDEX

ADITYA BIRLA
GRASIM

26th June 2025

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. Kashish Sain,** has successfully completed internship from **26th May 2025 to 25th June 2025** at Grasim Industries Limited, VFY – Fashion Yarn Business, Kalyan Unit.

As part of the Internship programme, she worked in the **Prod - PSY - Viscose department.** She has worked on the project on **"An Overview of the Viscose Plant".** The objective of this project was to understand and gain hands-on exposure to plant operations, understand key technical processes like pulping, xanthation, dissolution, filtration, and spinning, and observe how theoretical concepts are applied in an industrial setup.

During the internship period, she took keen interest in the working of the mentioned departments. She is hard-working and diligent. We wish her success in all future endeavors.

For Grasim Industries Limited
VFY – Fashion Yarn Business, Kalyan Unit.

Century Rayon-Grasim Industries Ltd. * P.B. No.22 SHAHAD 421103

Shrikant B Gore
Function Head
Human Resources

A
Internship Report
on
Transformer Oil Analysis

Submitted in partial fulfilment of the requirement of the degree of Bachelor Of Technology of the 4th Year

In

Chemical Engineering

Submitted by

Name	**Roll No.**
MADASU NAGA	22021122

DEPARTMENT OF CHEMICAL ENGINEERING

School of Studies Engineering & Technology

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central University Established by The Central University Act 2009 No. 25 of 2009)

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CERTIFICATE OF VOCATIONAL TRAINING - 2025
व्यावसायिक प्रशिक्षण प्रमाण पत्र - 2025

THE CERTIFICATE IS AWARDED TO
MADASU NAGA
VT Roll No -VT25CHEM041
Branch - CHEMICAL ENGINEERING
Name of College/Institute - GURU GHASIDAS VISHWAVIDYALAYA,BILASPUR

For satisfactorily completing **Vocational Training at NTPC, Sipat, Bilaspur** for a period of four weeks from 16/06/2025 to 15/07/2025. The participant has successfully completed the course and has also completed the project assigned to him/her as part of this course. We wish him/her a bright and successful future.

DATE -19/07/2025
Ref No. RLI/SIPAT/VT/CERT/2025/VT25CHEM041

Nakka Ramesh
Sr. Manager (RLI)

KV Prasad
GM & Head (RLI-Simulator)

Formation of Ni/CeO_2-MgO catalyst for Dry Reforming of Methane

An Internship Report

In Partial Fulfilment of the Requirement for Award of Degree of

Bachelor of Technology of the 4th Year in Chemical Engineering

Submitted By

Mahi Srivastava (22021123)

Under the Guidance of

Dr. Prateek Khatri

Assistant Professor

(NIT Rourkela)

DEPARTMENT OF CHEMICAL ENGINEERING

SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

July 2025

CERTIFICATE

Certified that the Major Project Report entitled ***"Formation of Ni/CeO_2-MgO catalyst for Dry Reforming of Methane"*** submitted by Mahi Srivastava of B.Tech. 7th semester, in partial fulfillmemt of the requirements for the award of degree in Bachelor of Technology (B. Tech) in Chemical Engineering, is according to the students' own investigation carried out by them in the Department of Chemical Engineering, NIT Rourkela, during the session 2025-26.

Prof. Amit Jain
HoD
Department of Chemical Engineering
SoS of Engineering & Technology, GGV

Dr. Prateek Khatri
Supervisor
Department of Chemical Engineering
National Institute of Technology, Rourkela

NATIONAL INSTITUTE OF TECHNOLOGY ROURKELA

CERTIFICATE

OF COMPLETION

This Certificate is Awarded to

Mahi Srivastava

Guru Ghasidas Vishwavidyalaya

has successfully completed summer internship program in

Chemical Engineering

Conducted from 16th May to 16th June 2025
at Department of Chemical Engineering, NIT Rourkela

Dr. Prateek Khatri
Assistant Professor
Department of Chemical Engineering
National Institute of Technology Rourkela

Date: 16/06/2025

Prof. Prateek Khatri
Supervisor

ABSTRACT

The rapid growth of the global population and ongoing socioeconomic development have significantly increased worldwide energy demands, leading to a surge in fossil fuel usage and a consequential rise in greenhouse gas emissions. These emissions, primarily composed of stable and hazardous gases like CO_2 and CH_4, are major contributors to pressing environmental problems such as global warming, unpredictable weather patterns, and the loss of biodiversity. In response to these challenges, the dry reforming of methane (DRM) presents a promising strategy by converting greenhouse gases into valuable syngas. However, DRM's highly endothermic nature and tendency for side reactions pose considerable catalytic challenges.

This study investigates the performance of a nickel-based catalyst supported on a ceria–magnesia (CeO_2-MgO) mixed oxide for the DRM process. The catalyst, containing 15 wt% Ni, was synthesized via coprecipitation of the support and subsequent impregnation of nickel. Ammonia was used as the precipitating agent for the support preparation. The resulting catalyst was thoroughly characterized using X-ray diffraction (XRD), and BET surface area analysis. Our findings focus on how the combined use of CeO_2 and MgO as support materials enhances the catalyst's performance, specifically at lower DRM reaction temperatures, offering a viable approach to efficient syngas production while addressing environmental concerns related to greenhouse gas emissions.

A Project Report

on

COAL ANALYSIS AND IT'S EFFECT ON COMBUSTION

Submitted in partial fulfilment of the requirement for award of degree of

Bachelor of Technology in Chemical Engineering

Submitted by

Mayank Dewangan 22021124

Guide

Nakka Ramesh
Sr. Manager (RLI)
REGIONAL LEARNING INSTITUTE,
NTPC, SIPAT

DEPARTMENT OF CHEMICAL ENGINEERING
School of Studies of Engineering & Technology
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A Central University Established by the Central University Act 2009 No. 25 of 2009)

REGIONAL LEARNING INSTITUTE, NTPC, SIPAT
क्षेत्रीय ज्ञानार्जन संस्थान, एनटीपीसी, सीपत
CERTIFICATE OF VOCATIONAL TRAINING - 2025
व्यावसायिक प्रशिक्षण प्रमाण पत्र – 2025

THE CERTIFICATE IS AWARDED TO

MAYANK DEWANGAN

VT Roll No - VT25CHEM028

Branch – CHEMICAL ENGINEERING

Name of College/Institute - GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

For satisfactorily completing Vocational Training at NTPC, Sipat, Bilaspur for a period of four weeks from 16/06/2025 to 15/07/2025. The participant has successfully completed the course and has also completed the project assigned to him/her as part of this course. We wish him/her a bright and successful future.

Ref No. RLI/SIPAT/VT/CERT/2025/VT25CHEM028

Nakka Ramesh
Sr. Manager (RLI)

KV Prasad
GM & Head (RLI-Simulator)

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SUMMER TRAINING REPORT

AT

NATIONAL THERMAL POWER CORPORATION (SIPAT)

ON

WATER CHEMISTRY FOR POWER PLANT WITH SPECIFIC REFERENCE TO SUPERCRITICAL BOILER

(June 2025-July 2025)

(SUBMITTED BY)

MOHIT AASHUTOSH HARSHVARDHAN

(ROLL NUMBER: 22021125)

(ENROLLMENT NUMBER: GGV/22/01525)

(2025-26)

Department of Chemical engineering

GURU GHASIDAS VISHWAVIDYALAYA

BILASPUR (C.G.) 495009

(A Central Universities established by Central Universities Act, 2009)

DECLARATION

I, Mohit Aashutosh Harshvardhan a student of chemical engineering department 7th semester in the year 2022-2026 having Roll No. 22021125, Enrollment No. (GGV/22/01525), hereby declare that I have undergone training at NATIONAL

Date: 12/08/2025

CONTENT

1. ABSTRACT

Water chemistry plays a critical role in ensuring the efficiency, safety, and longevity of power plant operations, particularly in supercritical boilers used in modern thermal power plants like NTPC Sipat Super Thermal Power Station. Supercritical boilers operate at high temperatures and pressures, necessitating stringent water quality to prevent corrosion, scaling, and fouling in boiler tubes and turbine system. This report explores the significance of maintaining the key parameters of water such as pH, dissolved oxygen, and conductivity to enhance thermal efficiency downtime. Emphasis is placed on the unique challenges posed by supercritical boiler systems, including the need of ultra-pure water to withstand extreme operating conditions and implementation of advanced treatment process like AVT (All Volatile Treatment), OT (Oxygenated Treatment), Phosphate Treatment, demineralisation and chemical dosing. By analyzing the water chemistry practises at NTPC Sipat, which sources water from the Hasdeo River, this study highlights the critical relationship between water quality and operational performance, underscoring the importance of robust water management strategies in achieving sustainable and efficient power generation.

Training and certificate

REGIONAL LEARNING INSTITUTE, NTPC, SIPAT
क्षेत्रीय ज्ञानार्जन संस्थान, एनटीपीसी, सीपत
CERTIFICATE OF VOCATIONAL TRAINING - 2025
व्यावसायिक प्रशिक्षण प्रमाण पत्र – 2025

THE CERTIFICATE IS AWARDED TO
MOHIT AASHUTOSH HARSHVARDHAN
VT Roll No - VT25CHEM007
Branch – CHEMICAL ENGINEERING
Name of College/Institute - GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

For satisfactorily completing Vocational Training at NTPC, Sipat, Bilaspur for a period of four weeks from 16/06/2025 to 15/07/2025. The participant has successfully completed the course and has also completed the project assigned to him/her as part of this course. We wish him/her a bright and successful future.

Ref No. RLI/SIPAT/VT/CERT/2025/VT25CHEM007

Nakka Ramesh
Sr. Manager (RLI)

KV Prasad
GM & Head (RLI-Simulator)

A Project Report

On

Design and Simulation of Distillation Column Using MATLAB

Submitted in Partial Fulfilment of the Requirement for Award of Degree of

Bachelor of Technology in Chemical Engineering

Submitted By

MUKESH KUMAR

School of Studies, Engineering & Technology (Institute of Technology) Guru Ghasidas Vishwavidyalaya, Bilaspur Chhattisgarh-495009

Dates: 5th June to 15th July, 2025

Indian Institute of Chemical Engineers (IIChE)

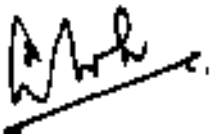
Dr. H. L. Roy Building, Jadavpur University Campus,

188Raja Subodh Chandra Mullick Road, Kolkata 700 032

www.iiche.org.in/iichehqfb@gmail.com/director.ti@iiche.org.in

Certificate from the IIChE

This is to certify that **MUKESH KUMAR** from **School of Studies, Engineering & Technology (Institute of Technology) Guru Ghasidas Vishwavidyalaya, Bilaspur Chhattisgarh-495009** successfully completed online summer internship programme in our organization. The matter embodied in this report is a genuine to the best of our knowledge and belief and has not been submitted before, neither to this Institute nor to any other organization for the fulfilment of the requirement of any course of study. During her internship tenure in IIChE, we found her as a hardworking, sincere, and diligent person and her behaviour and conduct was good. We wish her all the best for her future endeavour



Chief Coordinator, OIP-2025

ABSTRACT

Distillation is one of the most widely used separation processes in the chemical and petrochemical industries for the purification and separation of liquid mixtures based on differences in volatilities. The design and simulation of a distillation column require a strong understanding of thermodynamics, mass transfer, and process design principles. This report presents a detailed study on the design and simulation of a binary distillation column using MATLAB, with a particular focus on the graphical McCabe-Thiele method and stage-by-stage analysis.

The main objective of this internship project was to develop a MATLAB-based tool capable of calculating the number of theoretical stages, locating the feed stage, and generating the McCabe-Thiele diagram for a given set of input parameters such as distillate composition, bottoms composition, feed condition (q), relative volatility, and reflux ratio. MATLAB was selected due to its powerful computational capabilities, rich plotting functions, and ability to build customizable GUIs for user interactivity.

The code developed performs equilibrium calculations using relative volatility and constructs both the rectifying and stripping operating lines. The feed condition is represented through the q-line, and the intersection point of these lines determines the feed stage. A staircase construction method is implemented to calculate and visualize the number of ideal stages required to achieve the desired separation. Additionally, a Graphical User Interface (GUI) was created using MATLAB's App Designer, enabling users to input parameters dynamically and view the resulting simulation interactively.

Simulation results demonstrate that the number of theoretical stages is significantly influenced by the relative volatility, feed composition, and reflux ratio. The McCabe-Thiele diagram produced provides clear insight into how changes in design parameters affect the column performance. The GUI enhances the learning experience by simplifying interaction with complex calculations and improving visualization.

This project not only reinforces fundamental concepts of distillation but also highlights the versatility of MATLAB as a tool for process design, simulation, and educational purposes. Looking ahead, the scope of MATLAB in process engineering continues to grow with integration into digital twin systems, real-time optimization, and AI-driven control strategies. This work serves as a foundation for future exploration of more complex multicomponent distillation systems, dynamic simulations, and integration with industrial simulation platforms.

Report

On

Industrial Internship Training Program

OSTP-2025

Subject Name: Petroleum Refining Engineering

Submitted in Partial Fulfilment of the Requirements for the mandatory Industrial Internship training programme

Submitted by:
Mukesh Kumar Sahu
(22021127)

GURU GHASIDAS CENTRAL UNIVERSITY
BILASPUR C.G.

Dates: 5th June to 15th July, 2025

Terra Green Technologies Technologies Pvt. Ltd
12th Floor, Millennium City II Park, Block GP, Sec V, Kolkata – 700091
https://terra-green.in/contact/ terragreen.corp@gmail.com

Certificate

This is to certify that **MUKESH KUMAR SAHU** from **GURU GHASIDAS CENTRAL UNIVERSITY BILASPUR CHHATISGARH** successfully completed online summer internship programme in our organization. The matter embodied in this report is a genuine to the best of our knowledge and belief and has not been submitted before, neither to this Institute nor to any other organization for the fulfilment of the requirement of any course of study. During her internship tenure in Terra Green Technologies Pvt. Ltd, we found her as a hardworking, sincere, and diligent person and her behaviour and conduct was good. We wish her all the best for her future endeavour.

Shayan Mal

Training Coordinator, OSTP-2025

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2. Discussion on different industrial Processes & applications	8-10
3. Case study analysis with reference to industrial application (if any)	5-6
4. Scope of Research and development activity	2
5. Summary	1
6. Observation / Opinion	1