



**DEPARTMENT OF ELECTRONICS AND
TELECOMMUNICATION ENGINEERING
INDIRA GANDHI INSTITUTE OF TECHNOLOGY,
SARANG**

CERTIFICATE

This is to certify that the work contained in the report titled “**DESIGN AND IMPLEMENTATION OF 256-BIT DATA SECURITY UNIT WITH THE ANALYSIS OF SECURITY ATTACKS USING VHDL**” submitted by (Soumya Ranjan Panigrahi-1921105070), (Manaswini Mishra-1801105248), (Ajay Kumar Manadhata-1921105057) has been carried out under the supervision of Mr. Paresh Kumar Pasayat, Assistant Professor in Electronics and Telecommunication Engineering and this work has not been submitted elsewhere for a degree.

S. Pasayat
31/05/2022
Mr. Paresh Kumar Pasayat
Project Supervisor

Aru
31/05/2022
Dr. (Mrs.) Ashima Rout
Head of the Department

S
31/05/2022
External Examiner



Department of Electronics and Telecommunication
Engineering

Indira Gandhi Institute of Technology, Sarang

CERTIFICATE OF APPROVAL

This is to certify that we have examined the project entitled "IoT Based Environment Quality Monitoring System" submitted by Abhijit Sahoo, RegistrationNo.-1801105004; Debasish Adhikari, RegistrationNo.-1801105148; Sunil Kumar Das, Registration No.-1921105072; Udgata Priyadarshini Mohanty, Registration No.-1801105582, IGIT, Sarang. We here by accord our approval of it as a project work carried out and presented in a manner required for its acceptance for the partial fulfillment for the Bachelor Degree of Technology in Electronics & Telecommunication Engineering for which it has been submitted. This approval does not necessarily endorse or accept every statement made, opinion expressed or conclusions drawn as recorded in this project, it only signifies the acceptance of the project for the purpose it has been submitted.

Dr. [Signature]
31/05/22

Head of Department
ETC Engineering
IGIT, Sarang

[Signature]
31/05/22
External Examiner



Department of Electronics and Telecommunication
Engineering

Indira Gandhi Institute of Technology, Sarang

CERTIFICATE OF APPROVAL

This is to certify that we have examined the project entitled "Target Detection using Space-Time Adaptive using Airborne Radar" submitted by Suchismita Das, Registration No.-1801105522; Arpita Das Registration No.-1921105061; Amrita Sahoo, Registration No.-1801105056; Ansuman Swain, Registration No.-1921105059, Tofan Kumar Patra, Registration No.-1921105074 IGIT, Sarang. We here by accord our approval of it as a project work carried out and presented in a manner required for its acceptance for the partial fulfillment for the Bachelor Degree of Technology in Electronics & Telecommunication Engineering for which it has been submitted. This approval does not necessarily endorse or accept every statement made, opinion expressed or conclusions drawn as recorded in this project, it only signifies the acceptance of the project for the purpose it has been submitted.

Prof.
31/05/2022

(Head of the Department
ETC Engineering IGIT, Sarang

Le
31/05/2022
(External Examiner)



Department of Electronics and Telecommunication
Engineering

Indira Gandhi Institute of Technology, Sarang

CERTIFICATE OF APPROVAL

This is to certify that we have examined the project entitled "Target Detection using Space-Time Adaptive using Airborne Radar" submitted by Suchismita Das, RegistrationNo.-1801105522; Arpita Das RegistrationNo.-1921105061; Amrita Sahoo, Registration No.-1801105056; Ansuman Swain, Registration No.-1921105059, Tofan Kumar Patra, Registration No.-1921105074 IGIT, Sarang. We here by accord our approval of it as a project work carried out and presented in a manner required for its acceptance for the partial fulfillment for the Bachelor Degree of Technology in Electronics & Telecommunication Engineering for which it has been submitted. This approval does not necessarily endorse or accept every statement made, opinion expressed or conclusions drawn as recorded in this project, it only signifies the acceptance of the project for the purpose it has been submitted.

Arpita
31/05/2022
(Head of the Department)

ETC Engineering IGIT, Sarang

Arpita
31/05/2022
(External Examiner)



Department of Electronics and Telecommunication Engineering
Indira Gandhi Institute of Technology, Sarang

CERTIFICATE OF APPROVAL

This is to certify that we have examined the project entitled "Performance Evaluation of Channel Coding Techniques for Multimedia Streaming" submitted by Milan Kumar Sahu, Registration No.-1901105383; Sagar Sahoo, Registration No.-2021105083; Soumya sai Padhy, Registration NO. 20211050889 IGIT, Sarang. We here by accord our approval of it as a project work carried out and presented in a manner required for its acceptance for the partial fulfilment for the Bachelor Degree of Technology in Electronics & Telecommunication Engineering for which it has been submitted. This approval does not necessarily endorse or accept every statement made, opinion expressed or conclusions drawn as recorded in this project, it only signifies the acceptance of the project for the purpose it has been submitted.

Ashima Rout
17/05/2023

(Dr. Ashima Rout)
Head of the Department
Dept. of E & TC Engineering
IGIT SARANG

Sagar Sahoo

(External Examiner)

Sagar Sahoo

Project Supervisor
Dept. of E & TC Engineering
IGIT SARANG



Department of Electronics and Telecommunication
Engineering
Indira Gandhi Institute of Technology, Sarang

CERTIFICATE OF APPROVAL

This is to certify that we have examined the project entitled "WATER QUALITY MONITORING USING IoT" submitted by SWAGAT NARAYAN MOHANTY, Registration No- 1801105551; SUBHASHMITA MISHRA, Registration No- 1801105513; MIRZA SARTAZ BAIG, Registration No- 1801105262; ABHISHEK RATH, Registration No- 1801105014; NIGAMANANDA DEHURY, Registration No- 1801105279, IGIT, Sarang. We here by accord our approval of it as a project work carried out and presented in a manner required for its acceptance for the partial fulfilment for the Bachelor Degree of Technology in Electronics & Telecommunication Engineering for which it has been submitted. This approval does not necessarily endorse or accept every statement made, opinion expressed or conclusions drawn as recorded in this project, it only signifies the acceptance of the project for the purpose it has been submitted.

JKL
31/05/2022

(Head of Department
ETC Engineering
IGIT, Sarang)

Te
31/05/2022

(External Examiner)



INDIRA GANDHI INSTITUTE OF TECHNOLOGY, SARANG

Certificate

This is to certify that the thesis entitled “**Study of Reinforcement of Aluminium Metal Matrix Composites With SiC in Stir Casting**” submitted by Piyush Muduli, Satya Ranjan Mishra, Himansu Sekhar Kalandi, Smiti Suhani Das, and Lipsa Rath; bearing registration number 1801105297, 1801105413, 1921105102, 1801105462 and 1921105104 respectively of 8th semester, B. Tech, Indira Gandhi Institute Of Technology, Sarang for the partial fulfillment of the requirement for the award of the degree of Bachelor of Technology in Metallurgical and Materials Engineering during the academic year 2021-22 is a bonafide record of work/research carried out by them under my supervision. The content of this report/dissertation, in the full or parts, has not been submitted to any other institute or university for the award of any degree or diploma.

SC
24/05/2022

Supervisor

Dr. Suresh Chandra Patnaik
(Professor)
Dept. of Metallurgical and
Materials Engineering

[Signature]

Head of the Department

Dr. Prafulla Kumar Mallik
(Professor)
Dept. of Metallurgical and
Materials Engineering

Shubhra Bujpai
24/5/22

External Examiner

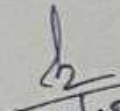
CERTIFICATE

ACKNOWLEDGMENT

This is to certify that Manisha, Toshabindu, Purushottam and Soumya of final year of Chemical Engineering has submitted Major Project report entitled "**Removal of Methylene Blue from Wastewater by Adsorption**" in partial fulfilment for the award of Bachelor of Technology Degree in the department of **Chemical Engineering, Indira Gandhi Institute of Technology, Sarang**. This project is a bonafide work performed by them under my guidance in the academic session 2021-2022.

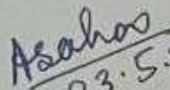
We are extremely grateful to Dr. Dipa Das (Head of the Department, Chemical Engineering, IGIIT, Sarang) and all the faculty members for providing support for our experiments and analysis during the duration.

Finally, we extend our sincere thanks to all those who have helped us during our project work and have involved directly and indirectly in our work.

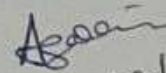

23/05/2022

Dr. Dipa Das

Head of the Department
Department of Chemical
Engineering


23.5.2022

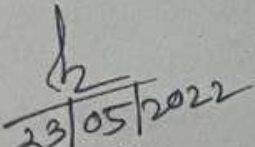
Signature of External


23/05/2022

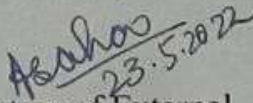
Dr. Anup Kumar Swain
Assistant Professor
Department of Chemical
Engineering

CERTIFICATE

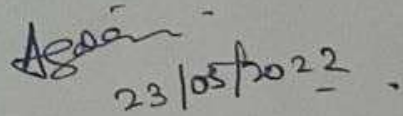
This is to certify that Sweta, Kajol, Shibananda and Swayam of final year of Chemical Engineering has submitted Major Project report entitled "**Removal of Malachite Green from Wastewater by Adsorption**" in partial fulfilment for the award of **Bachelor of Technology** Degree in the department of **Chemical Engineering, Indira Gandhi Institute of Technology, Sarang**. This project is a bonafide work performed by them under my guidance in the academic session 2021-2022.



Dr. Dipa Das
Head of the Department
Department of Chemical
Engineering



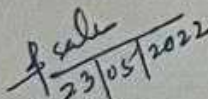
Signature of External

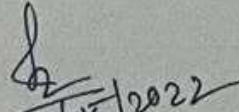


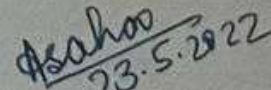
Dr. Anup Kumar Swain
Assistant Professor
Department of Chemical
Engineering

CERTIFICATE

This is to certify that the report entitled, "A REVIEW ON COAL BENEFICIATION" was carried out by **P Vandana Priya**, under the guidance of Dr. (Mrs.) Brahmotri Sahoo for the partial fulfilment towards the award of Bachelors of Technology in Chemical Engineering at **INDIRA GANDHI INSTITUTE OF TECHNOLOGY, SARANG, DHENKANAL** in the academic year 2021-22. This report has been examined and found to be satisfactory. I considered that this review report has reached the standards and fulfilled the requirements of rules and regulations relating to the nature of degree. The contents embodied in this project report have not been submitted for the award of any degree or diploma in this or any other university.


23/05/2022
Guide Signature


23/05/2022
HOD Signature


23.5.2022
External Signature

CERTIFICATE

This is to certify that the report entitled, "A brief review on fluidization and comparison with the spouted bed fluidization" was carried out by **Raja bharat bhusan sethi** under the guidance of **Dr. (Mrs) Brahmotri sahoo** for the partial fulfilment towards the award of Bachelors of Technology in Chemical Engineering at **INDIRA GANDHI INSTITUTE OF TECHNOLOGY, SARANG, DHENKANAL** in the academic year 2021-22. This report has been examined and found to be satisfactory. I considered that this review report has reached the standards and fulfilled the requirements of rules and regulations relating to the nature of degree. The contents embodied in this project report have not been submitted for the award of any degree or diploma in this or any other university.

f. sah
23/05/2022

Guide Signature

h
23/05/2022

HOD Signature

A. Sahoo
23.5.2022

External Signature

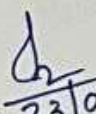


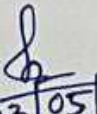
INDIRA GANDHI INSTITUTE OF TECHNOLOGY, SARANG

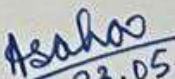
CERTIFICATE

This is to certify that the report entitled, “A REVIEW ON DIFFERENT REACTOR CONFIGURATIONS FOR POST COMBUSTION CO₂ CAPTURE BY ADSORPTION PROCESS” was carried out by **Tushar Agarwal, Rajnandini Sahu, Siddhant Shekhar Sahu, Subham Kumar Das** under the guidance of **Dr. (Mrs.) Dipa Das** for the partial fulfillment towards the award of Bachelors of Technology in Chemical Engineering at INDIRA GANDHI INSTITUTE OF TECHNOLOGY, SARANG, DHENKANAL in the academic year 2021-22. This report has been examined and found to be satisfactory.

I considered that this review report has reached the standards and fulfilled the requirements of rules and regulations relating to the nature of degree. The contents embodied in this project report have not been submitted for the award of any degree or diploma in this or any other university.


23/05/2022
Guide Signature


23/05/2022
HOD Signature

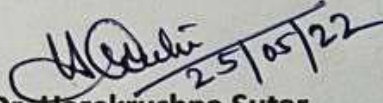

23.05.2022
External Signature



DEPARTMENT OF CHEMICAL ENGINEERING
INDIRA GANDHI INSTITUTE OF TECHNOLOGY, SARANG

CERTIFICATE

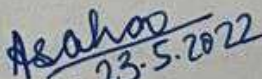
This is to certify that the thesis entitled "Electrical Behaviour and Spherulite Morphology of HDPE/PP Polyblends with HDPE as Base Material" is a bonafide research work carried out by, Deesha Mishra (1801105157), Pratikshya Sahoo (1801105315), Chandrakant Sahoo (1801105136)in partial fulfilment of the requirements for the Bachelor of Technology in Chemical Engineering at Indira Gandhi Institute of Technology, Sarang. This is record of the bonafide research work carried out by them in the Department of Chemical Engineering under my supervision. We believe that this thesis fulfils part of the requirements for the award of degree of Bachelor in Technology by research. The results embodied in the thesis have not been submitted for the award of any other degree else-where.

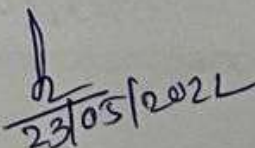

25/05/22
Dr. Harekrushna Sutar

Asst. Professor, Guide

Chemical Engineering

Major Project Coordinator


23.5.2022
External Examiner



23/05/2022
Dr. Deepa Das

Head of the Department

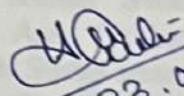
Chemical Engineering

CERTIFICATE

This is to certify that the thesis entitled "DETERMINATION OF RHEOLOGICAL PROPERTIES OF POLYPROPYLENE FILLED WITH COLEMANITE" Submitted by AMARTYA BIBHU SADUAL, GURU PRASAD SAHOO, SRITILAK SAHU to the department of chemical engineering, Indira Gandhi Institute Of Technology, Sarang for the award in bachelor of technology. This is a bonafide research work carried out in the department of chemical engineering under the supervision and guidance of Asst. Prof. Dr. Harekrushna Sutar.

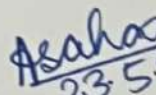

23/05/2022

HEAD of the DEPARTMENT
DEPARTMENT OF Chemical Engg. ,
IGIT,SARANG


23.05.2022

PROJECT SUPERVISOR

(Dr. H. Sutar)


23.5.2022

EXTERNAL FACULTY


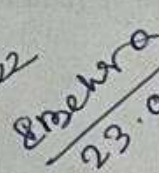


**INDIRA GANDHI INSTITUTE OF TECHNOLOGY,
SARANG, DHENKANAL-759146**

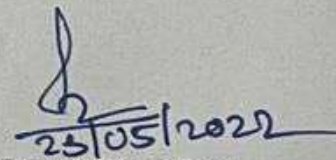
(An autonomous Institute of Govt. of Odisha)

CERTIFICATE

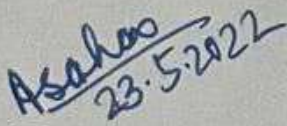
This is to certify that the major project report entitled “**PRODUCTION AND CHARACTERIZATION OF BIODIESEL FROM LOCALLY SOURCED FOOD STALL WASTE COOKING OIL**” submitted by **Adity Pradhan, Rajesh Mohapatra, Tapan Sethi and Anushree Mohanta** bearing university registration number **1801105023, 1801105352, 1801105573, 1801105076**, respectively to the **Department of Chemical Engineering, Indira Gandhi Institute of Technology, Sarang**, in partial fulfilment prerequisites for the award of the degree of “**Bachelor of Technology**” in the Department of **Chemical Engineering** is a bona-fide work disbursed by them under my supervision and guidance in the academic session 2018-2022.


23.05.2022

23.05.2022

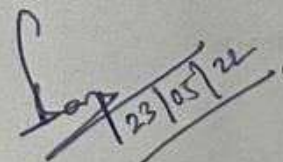
**Mrs. Ipsita D. Behera &
Mr. Pranab Ku. Mahalik**
Assistant Professor
Project Guide


23/05/2022

Dr. (Mrs.) Dipa Das
Head of the department
Department of Chemical Engineering


23.5.2022

External Examiner


23/05/22

Internal Examiner



**INDIRA GANDHI INSTITUTE OF TECHNOLOGY,
SARANG, DHENKANAL-759146**

(An autonomous Institute of Govt. of Odisha)

CERTIFICATE

This is to certify that the major project report entitled “**Production Of Biodiesel From Waste Cooking Oil**” submitted by **Surendra Badaik, Sangram Behera and Lipsa Mohanty** bearing university registration number **1801105540, 1801105397, 1801105237** respectively to the **Department of Chemical Engineering, Indira Gandhi Institute of Technology, Sarang,** in partial fulfilment prerequisites for the award of the degree of “**Bachelor of Technology**” in the Department of **Chemical Engineering** is a bona-fide work disbursed by them under my supervision and guidance in the academic session 2018-2022.

Behera
23.05.22

Mrs. Ipsita D. Behera
Assistant Professor
Project Guide

Pranab Ku. Mahalik
23.05.2022

Mr. Pranab Ku. Mahalik
Assistant Professor
Project Guide

Dipa Das
23/05/2022

Dr. (Mrs.) Dipa Das
H.O.D
Department of Chemical
Engineering

Asahos
23.5.2022

External Examiner



DEPARTMENT OF CHEMICAL ENGINEERING
INDIRA GANDHI INSTITUTE OF TECHNOLOGY,
ODISHA, SARANG-759146

CERTIFICATE OF APPROVAL

This is to certify that we have examined the thesis entitled “**DESIGN AND FABRICATION OF PORTABLE AIR CONDITIONER(AC)**” submitted by the group of following members, towards partial fulfillment for the award of degree of **Bachelor of Technology** of **Indira Gandhi Institute of Technology, Sarang, Odisha**. We hereby accord out approval of it as a thesis work carried out and presented in a manner required for its acceptance for the partial fulfillment for the award of degree of Bachelor of Technology in *Chemical Engineering* for which it has been submitted. The approval does not necessarily endorse or accept every statement made, opinion expressed or conclusions drawn as recorded in this thesis. It only signifies the acceptance of the thesis for the purpose it has been submitted.


(Internal Examiner)


23.5.2022
(External Examiner)



Department Of Chemical Engineering
Indira Gandhi Institute Of Technology Sarang
Dhenkanal- 759146

CERTIFICATE

This is to certify that the thesis report entitled “**PREPARATION AND CHARACTERISATION OF BIO-PLASTIC USING STARCH DERIVATIVES**” submitted by **Sourav Ranjan Barik** bearing University Regd No – **1801105497**, **Amarendra Patasani** bearing University Regd No- **1921105001** and **Debasish Jena** bearing University Regd No- **1801105145** in partial fulfilment of requirements for the award of Bachelor of Technology degree in **Chemical Engineering at Indira Gandhi Institute of Technology, Sarang** is an authentic work carried out under my supervision and guidance. To the best of my knowledge, the matter embodied in this project report has not been submitted to any other university/institute for the award of any Degree (UG/PG) or Diploma.

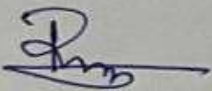
Kashinath Barik
M. Kashinath Barik
Assistant Professor
Supervisor

Dipa Das
Dr. Dipa Das
H.O.D. Chemical Engg. Dept
I.G.I.T. Sarang

Asahoo
23.5.2022
External Examiner

CERTIFICATE

This is to certify that major project entitled “ **Study Of Physical Properties and Morphology Of Zinc Oxide filled Chitosan based hybrid membrane for DMFC**” submitted by Sudipti Nayak, Aklant Bhanja, Rutu Parna Panda, Bhabani Shankar Barik in partial fulfilment prerequisites for the award of the degree of “**Bachelor Of Technology**” in the department of Chemical Engineering, Indira Gandhi Institute Of Technology, Sarang. This project is a bonafide work distributed by them under my supervision and guidance in the academic session 2018-2022.

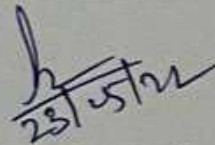


MR. RABI RANJAN MURMU

ASSISTANT PROFESSOR

DEPARTMENT OF CHEMICAL

ENGINEERING

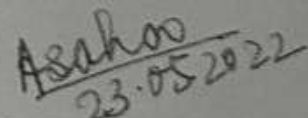


DR. DIPAS DAS

HEAD OF DEPARTMENT

DEPARTMENT OF

CHEMICAL ENGINEERING



INTERNAL EXAMINER

EXTERNAL EXAMINER

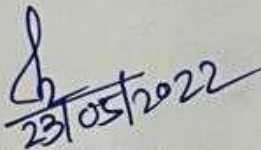


INDIRA GANDHI INSTITUTE OF TECHNOLOGY, SARANG

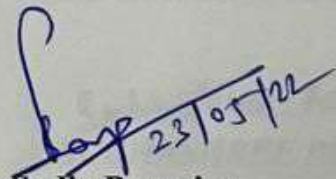
(An autonomous Institute of Govt. of Odisha)

CERTIFICATE

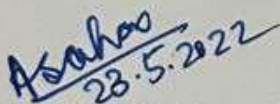
This is to certify that the minor project report entitled “**DEVELOPMENT OF STEADY STATE SIMULATOR OF BINARY CONTINUOUS DISTILLATION COLUMN**” submitted by DEBASHISH SAHU, SHAIKH ATIF AZIZ and SUBHASHREE ROUT to the Department of **Chemical Engineering**, Indira Gandhi Institute of Technology, Sarang, in partial fulfilment prerequisites for the award of the degree of “**Bachelor of Technology**” **Chemical Engineering** is a bona-fide work disbursed by them under my supervision and guidance in the academic session 2018-2022.


23/05/2022

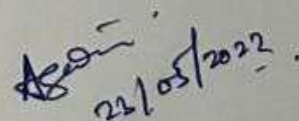
Dr. (Mrs.) Dipa Das
Head of the department
Department of Chemical Engineering


23/05/22

Dr. Sudip Banerjee
Assistant Professor
Project Supervisor


28.5.2022

External Examiner


23/05/2022

Internal Examiner

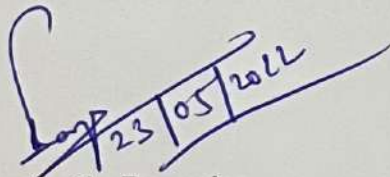


**INDIRA GANDHI INSTITUTE OF TECHNOLOGY,
SARANG, DHENKANAL-759146**

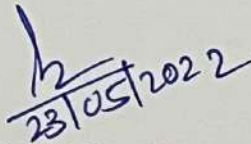
(An autonomous Institute of Govt. of Odisha)

CERTIFICATE

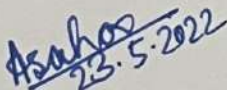
This is to certify that the major project report entitled “**Mathematical Modelling, Simulation and Control of Binary Continuous Distillation Column**” submitted by **Ananddeep Toppo, Ankit Abinash Mohanty and Satabdi Rath** bearing university registration number **1921105002, 1801105066, 1801105409**, respectively to the **Department of Chemical Engineering, Indira Gandhi Institute of Technology, Sarang**, in partial fulfilment prerequisites for the award of the degree of “**Bachelor of Technology**” in the Department of **Chemical Engineering** is a bona-fide work disbursed by them under my supervision and guidance in the academic session 2018-2022.


23/05/2022

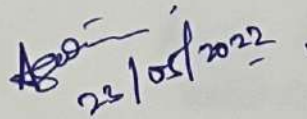
Dr. Sudip Banerjee
Assistant Professor
Project Guide


23/05/2022

Dr. (Mrs.) Dipa Das
Head of the department
Department of Chemical Engineering


23.5.2022

External Examiner


23/05/2022


Internal Examiner

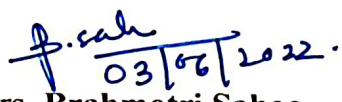


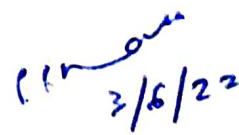
Department of Chemical
Engineering Indira Gandhi Institut
of Technology Sarang-759146
(ODISHA)


CERTIFICATE

This is to certify that the report entitled "**Preparation and characterisation of Bio-plastic Using Starch Derivatives**" submitted by **Guddirani Kansarali (Regd no-2007105002)** in fulfilment of the requirement for the award of Masters of Technology Degree in Chemical Engineering at Indira Gandhi Institute of Technology, Sarang is an original work executed under the supervision of Mr. Kashinath Barik during the academic year 2021-22.


Mr. Kashinath Barik
GUIDE
Assistant Professor
Department of Chemical Engineering
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Mrs. Brahmotri Sahoo
CO-GUIDE
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External Examiner Signature


Dr. (Mrs.) Dipa Das
HOD
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Sarang-759146 (ODISHA)



Department of Chemical Engineering
Indira Gandhi Institute of Technology
Sarang-759146 (ODISHA)

CERTIFICATE

This is to certify that the report entitled "A Review on Enhancement of Microbial Activity (Aspergillus) for Polyethylene Degradation" submitted by Sibangi Rath (Regd no-2007105001) in fulfilment of the requirement for the award of Masters of Technology Degree in Chemical Engineering at Indira Gandhi Institute of Technology, Sarang is an original work executed under the supervision of Mr. Rabiranjana Murmu during the academic year 2021-22.

03.06.2022

Mr. Rabiranjana Murmu

GUIDE

Assistant Professor
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03/06/22

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Dr. (Mrs.) Dipa Das

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3/6/22

External Examiner
Name and Signature

**Performance Analysis of Secure Chaotic OFDM-FSO
Communication**

A thesis submitted in partial fulfillment of the requirements for the award of the
degree of

MASTER OF TECHNOLOGY

IN

**ELECTRONICS AND TELECOMMUNICATION
ENGINEERING**

Submitted By

**SUDIPTA SAHOO
REGD. NO. :2007105023**

Under the guidance of

DR. (MRS) URMILA BHANJA, PROFESSOR



**DEPARTMENT OF ELECTRONICS AND
TELECOMMUNICATION ENGINEERING
INDIRA GANDHI INSTITUTE OF TECHNOLOGY, SARANG
DHENKANAL-759146**

**An Autonomous Institute of Government of Odisha
2020-2022**