

**SHEAR STRENGTH STUDIES OF
REINFORCED SOIL WITH NATURAL FIBRES**

A project report submitted in partial fulfilment of the requirements for the

Award of degree

BACHELOR IN TECHNOLOGY

IN

CIVIL ENGINEERING

BY

**LUGU HEMBRAM-1901105108
MILLENNIUM ROUTRAY-1901105112
RAKESH PRUSTY-1901105124
SAMIR HEMBRAM-1901105132
SIDHILAL SOREN-1901105138
SUBHAM NAYAK-1901105164
UDIT KUMAR SINGH-1901105160**

Under the Guidance of

Mr. SATYAPRIYA SENAPATI

Assistant Professor

Civil Engineering Department



**DEPARTMENT OF CIVIL ENGINEERING
INDIRA GANDHI INSTITUTE OF TECHNOLOGY
SARANG, DHENKANAL, ODISHA-759146**

APRIL 2023

**ANALYSIS OF CONCRETE BY PARTIAL REPLACEMENT
OF CEMENT WITH MARBLE DUST POWDER**

The Project Thesis is Submitted in Partial Fulfilment of the requirements for the Award of Degree

BACHELOR OF TECHNOLOGY

IN

CIVIL ENGINEERING

BY

SOMNATH PRASAD – 1901105141
SOURAV SWAIN – 1901105148
SAHANA MISHRA – 1901105130
SUBHADARSHINI SAHOO – 1901105152
STHITAPRANGYA MUDULI – 1901105151
SONALI PURTY - 1901105142

Under The Guidance Of

Mr. SURAJ KUMAR SAHU



**DEPARTMENT OF CIVIL ENGINEERING
INDIRA GANDHI INSTITUTE OF TECHNOLOGY
SARANG, DHENKANAL - 759146**

APRIL 2023

**EXPERIMENTAL STUDY OF STENGTH OF CONCRETE BY PARTIAL
REPLACEMENT OF CERAMIC WASTE AS COURSE AGGREGATE AND
ADDITION OF RECRON FIBER**

The Project Thesis is Submitted in Partial Fulfillment of the requirements for the Award of Degree

BACHELOR OF TECHNOLOGY

IN

CIVIL ENGINEERING

BY

Manaswee Ipsita – 1901105109.

Nutan Behera – 1901105116.

Priyabrata Dehury – 1901105120.

Priyanka Nayak – 1901105121.

Puspak Kumar Mahalik – 1901105122.

Satyajeet Sahu – 1901105136.

Sourabh Kishan Bhuyan – 1901105146.

Under The Guidance Of

Ms. Adyasha Priyadarshini
(Assistant Professor)



DEPARTMENT OF CIVIL ENGINEERING
INDIRA GANDHI INSTITUTE OF TECHNOLOGY
SARANG, DHENKANAL- 759146 APRIL 2023

Major Project
on
COMPERATIVE ANALYSIS OF WATER TANK
RESTING ON GROUND WITH VARYING CAPACITY

THE MAJOR PROJECT Thesis IS SUBMITTED IN PARTIAL FULFILMENT OF
THE REQUIREMENTS FOR THE AWARD OF DEGREE

BACHELOR OF TECHNOLOGY IN
CIVIL ENGINEERING

By

ANANTA NARAYANA GURU - 1901105059

BISHNU PRASAD RATH - 1901105077

ASHISH SAHU - 1901105070

JYOTIRMAYA SAHOO - 1901105102

Under the Guidance of
Dr. Bikash Ch. Panda



Department of Civil Engineering
Indira Gandhi Institute of Technology,
Sarang, Dhenkanal, Odisha-759146



INFLUENCE OF CHEMICAL ADMIXTURE ON FRESH AND HARDENED PROPERTIES OF CONCRETE

**THE MAJOR PROJECT REPORT IS SUBMITTED IN PARTIAL FULFILMENT OF
THE REQUIREMENTS FOR THE AWARD OF DEGREE OF**

**BACHELOR OF TECHNOLOGY IN
CIVIL ENGINEERING**

By

DOLAMANI MEHER

BINAYAK KUMAR JAGAT

BINJHU MURMU

HIMANSHU SHEKHAR BEHERA

DURGAPRASAD TUDU

ASHUTOSH PRADHAN

KOUSIKA SETH

Under the Guidance of

ASST. PROF. TRUSHNA JENA

*Department of Civil Engineering
Indira Gandhi Institute of Technology,
Sarang, Dhenkanal, Odisha-759146*

THE MAJOR PROJECT REPORT IS SUBMITTED IN
PARTIAL FULFILMENT OF
THE REQUIREMENTS FOR THE AWARD OF DEGREE OF
BACHELOR OF TECHNOLOGY IN
CIVIL ENGINEERING

BY

1901105128-RUPALI NANDA

1901105139-SIPRA MALLICK

1901105153-SUBHALAXMI SETHY

1901105150-SRUTIPARNA SETHI

1901105159-TRUPTIMAYEE JENA

1901105125-RITIMUKTA NAYAK

Under The Guidance Of

Mrs. TRUSHNA JENA



INDIRA GANDHI INSTITUTE OF TECHNOLOGY
SARANG, DHENKANAL-759146

DIRECT SHEAR TEST STUDIES ON SAND, STONE DUST & SLAG

The Project Thesis is Submitted in Partial Fulfilment of the requirements for the Award of Degree

BACHELOR OF TECHNOLOGY IN CIVIL ENGINEERING

BY

**MILAN SETHI – 1901105111
RAJESH KUMAR PATRA – 1901105123
PABANI SITARAM PATI – 1901105117
SMRUTI RANJAN BISWAL – 1901105163
PEEETAM DEEP – 1901105118
PRITISH DAS – 19901105119
SOUMYA RANJAN SAHOO – 1901105145**

Under The Guidance Of

Mr. SATYAPRIYA SENAPATI



**DEPARTMENT OF CIVIL ENGINEERING INDIRA GANDHI
INSTITUTE OF TECHNOLOGY SARANG, DHENKANAL - 759146
APRIL 2023**

DIRECT SHEAR TEST STUDIES ON SAND, STONE DUST & SLAG

The Project Thesis is Submitted in Partial Fulfilment of the requirements for the Award of Degree

BACHELOR OF TECHNOLOGY IN CIVIL ENGINEERING

BY

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PRITISH DAS – 19901105119
SOUMYA RANJAN SAHOO – 1901105145

Under The Guidance Of

Mr. SATYAPRIYA SENAPATI



DEPARTMENT OF CIVIL ENGINEERING INDIRA GANDHI
INSTITUTE OF TECHNOLOGY SARANG, DHENKANAL - 759146
APRIL 2023

ANALYSIS OF CONCRETE BY PARTIAL REPLACEMENT OF CEMENT WITH METAKAOLIN

**The Project Thesis is submitted in Partial Fulfilment of the requirements for the Award of
Degree**

BACHELOR OF TECHNOLOGY IN CIVIL ENGINEERING BY

**VISHAL BEHURA – 2021105038
SAHIL KUMAR PRADHAN – 1901105131
ROHANJEET BEHERA – 1901105216
SOUMYA SANDEEP PRADHAN – 1901105144
RAJESH KUMAR MALIK – 2021105032
SUBH ABHISHEK – 2021105035
KUNAL HANSDAH – 1901105106**

Under The Guidance Of

Mr. SURAJ KUMAR SAHU



**DEPARTMENT OF CIVIL ENGINEERING
INDIRA GANDHI INSTITUTE OF TECHNOLOGY
SARANG, DHENKANAL – 759146
APRIL 2023**

**SHEAR STRENGTH STUDIES OF
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BY

**LUGU HEMBRAM-1901105108
MILLENNIUM ROUTRAY-1901105112
RAKESH PRUSTY-1901105124
SAMIR HEMBRAM-1901105132
SIDHILAL SOREN-1901105138
SUBHAM NAYAK-1901105164
UDIT KUMAR SINGH-1901105160**

Under the Guidance of

Mr. SATYAPRIYA SENAPATI

Assistant Professor

Civil Engineering Department



**DEPARTMENT OF CIVIL ENGINEERING
INDIRA GANDHI INSTITUTE OF TECHNOLOGY
SARANG, DHENKANAL, ODISHA-759146**

APRIL 2023



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

CERTIFICATE OF APPROVAL

This is to certify that the project titled "MODELLING AND SIMULATION OF QUADCOPTER USING MATLAB" submitted by **DEBABALLAV RATH, REGD NO:-2021105072, SABUJA KUMAR MAHARANA REGD NO:- 2021105082 ,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.

Ashima Rout
17/05/2023

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

Ashwini

(External Examiner)

Lakhmika Mishra

(Mr.lakhmika Mishra)
Assistant Professor

Dept.of E&TC Engineering

IGIT SARANG

INDIRA GANDHI INSTITUTE OF TECHNOLOGY

SARANG, DHENKANAL – 759146



CERTIFICATE

This is to certify that the Project report entitled “**STUDY OF THE TRIBOLOGICAL PROPERTIES OF GRADE 5 Ti-6Al-4V ALLOY**” submitted by **Anwasha Mahapatra** bearing registration number **1901105399** in partial fulfillment of requirements for the award of Bachelor of Technology degree in **Mechanical Engineering** at **Indira Gandhi Institute of Technology, Sarang** is an authentic work carried out under our supervision and guidance. To the best of our 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.

Mr. Gaurab Kumar Ghosh

Asst. Professor

Supervisor

Dr. Surjyakant Panda

Guest Faculty

Co-Supervisor

External Examiner

Dept.

H.O.D

Mechanical Engineering

I.G.I.T, 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 "Enhancement of Network Intrusion Detection System Using Machine Learning Algorithm" submitted by PRADYUT PRIYADARSHI SAHOO, Regd.no-1901105369; MANJAY KUMAR SHARMA Regd.no:- 2021105077, 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.

Am
17/05/2023
(Dr. Ashima Rout)

Head of the Department

Dept. of E&TC Engineering

IGIT SARANG

Shree
(External Examiner)

Debapriya Parida
16.05.23
(Mrs. DEBAPRIYA PARIDA)

Assistant Professor

Dept. of E&TC Engineering

IGIT SARANG



INDIRA GANDHI INSTITUTE OF TECHNOLOGY, SARANG

Certificate

This is to certify that the thesis entitled “**Mechanical Properties and Microstructure Study of Hypoeutectic Al-Si Alloy Reinforced with In-situ TiB₂ Composite**” Submitted by Asutosh Khatua, Debashish Singh, Manav Pradhan, Sagarika Behera, Soumen Sircar, Subham Shekhar Behera bearing registration number 1801105092, 1801105151, 1801105249, 1801105376, 1921105116, 1801105510 respectively of 8th semester B.Tech, Indira Gandhi Institute of Technology, Sarang for the in partial fulfillments of the requirements 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 these students are 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.

SK Sahoo
24/05/22

Supervisor

Examiner

Mr.SK Sahoo
Asst. Professor
Dept of Metallurgical
&Materials Engg.

Bhabani P Sahoo
29.05.22

Co Supervisor

Mr. Bhabani P Sahoo
Asst.Professor
Dept of Metallurgical &
Materials Engg

PK Mallik
24/05

Head of Department

Prof.Dr.PK Mallik
Dept of Metallurgical &
Materials Engg.

Shubhra Bajpai
24.5.22

External



CERTIFICATE

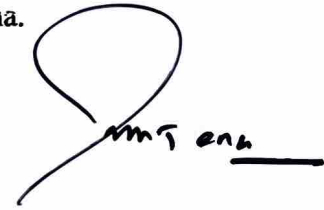
This is to certify that the project entitled “**STUDY THE DIELECTRIC PROPERTIES OF ALUMINIUM DROSS**” submitted by Sukanya Pani, Geeta Panda and Tanmay Kumar Sahoo of 8th Semester B.Tech to Indira Gandhi Institute of Technology, Sarang for the partial fulfilment of award of Bachelor of Technology in Metallurgical and Materials Engineering during the academic year 2022-23 is a bona-fide record of work/research carried out by them under my supervision. The content of this report, in the full or parts has not been submitted to any other institute or university for the award of any degree or diploma.



Supervisor



Head of the Department



External Examiner



CERTIFICATE

This is to certify that the report entitled “ **Enhancement of mechanical behaviour of thermomechanically processed mild steel** ” submitted by **Puspita Sahoo (1901105527)**, **Subhashree Mallick (1901105541)**, **Swagatika Pradhan (1901105548)**, **Biswajit Sahu (1901105508)**, **Sambid Kumar Nayak (1901105530)**, **Prasanta Kumar Pradhan (1901105524)**, in the partial fulfillment for the requirements for the award of the degree of Bachelor of Technology in **Metallurgical and Materials Engineering**, Indira Gandhi Institute of Technology, Sarang, Dhenkanal, Odisha during the academic session 2022-2023 is bonafide record of the project work carried by them under **Mrs. Swarnalata Behera (Assistant Professor)**. The approval does not necessarily endorse or accept every statement made, opinion expressed or conclusion drawn as recorded in the thesis. It only signifies the acceptance of the thesis for the purpose for which it is submitted.

S. Behera
18.05.23

Supervisor

Mrs. Swarnalata Behera

(Assistant Professor)

Dept. of Metallurgical and
Materials Engineering

Head of the Department

Dr. Prafulla Kumar Mallik

(Associate Professor)

Dept. of Metallurgical and
Materials Engineering

External Examiner



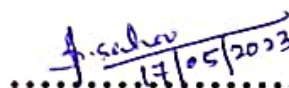
Department of Chemical Engineering
Indira Gandhi Institute of Technology, Sarang
Dhenkanal, Odisha – 759146

CERTIFICATE

This is to certify that the project report entitled “Demineralisation of fine and ultrafine coal particles of Talcher area by oil agglomeration technique” is a bonafide record of work submitted by Mitali Gouda, Priyambada Sethi, and Ankita Tripathy under the guidance of Dr. (Mrs.) Brahmotri Sahoo. It is submitted in partial fulfilment of the requirement for the award of Bachelor of Technology in Chemical engineering, Indira Gandhi Institute of technology, Sarang, Odisha.


.....

Dr. Dipa Das
HOD,
Chemical Department


.....

Dr. (Mrs.) Brahmotri Sahoo
Assistant Professor
Chemical Department


.....

(External Examiner)
Dr. Pyarimohan Dehury
Assistant Professor
ICT-IOC, Bhubaneswar



Department of Chemical Engineering
Indira Gandhi Institute of Technology
Sarang, Dhenkanal, Odisha-759146

CERTIFICATE

This is certify that the major project report entitled "*THEORETICAL & EXPERIMENTAL STUDIES ON PREPARATION OF SURFACTANT FREE EMULSION*" submitted by SATYAJEET MOHANTY (385033), SUMIT BARAI (385045), SANATAN MAHARANA (385031), BIKRAM KESHARI NAYAK (385055), RAKESH ROSHAN MOHANTY (385063) and RAMYA RACHITA ROUL (385026), under the guidance of Dr. Kshetramohan Sahoo in partial fulfillment 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 record of the work carried out by them in my supervision and guidance in the academic session 2019-2023.

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

Dr. Kshetramohan Sahoo
Assistant Professor
Chemical Engineering

Board of External

CERTIFICATE

This is to certify that the major project report entitled "Preparation, Characterization and Performance analysis of Chitosan-based membrane in DMFC" submitted by Sidheswar Nayak, Bishnupriya Barik, Jagat Jyoti Dash, Ananya Shaw, Lopamudra Bhanja, Sushil Aind 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 disbursed by them under my supervision and guidance in the academic session 2019-2023.


17.05.2023
GUIDE SIGNATURE


17/05/23
HOD SIGNATURE



17/05/23
EXTERNAL SIGNATURE





Department of Chemical Engineering
Indira Gandhi Institute of Technology
Sarang, Dhenkanal, Odisha-759146

CERTIFICATE

This is to certify that the project report entitled “**Physicochemical and biological analysis of Paradip refinery petroleum sludge**” is a bonafide record of work submitted by Rabindra Kumar Dash, Adarsha Samantaray, Akarsha Pradhan, Jaydeep Kanungo, Teyaswini Sahoo and Sindhupriya Choudhury under the guidance of **Dr. Ipsita Dipamitra Behera**. It is submitted in partial fulfilment of the requirement for the award of bachelor of technology in Chemical engineering, Indira Gandhi Institute of technology, Sarang, Odisha.


.....
Dr. Dipa Das
HOD,
Chemical Department


.....
Dr. Ipsita Dipamitra Behera
Assistant Professor
Chemical Department


.....
External Examiner



INDIRA GANDHI INSTITUTE OF TECHNOLOGY, SARANG

CERTIFICATE

This is to certify that the report entitled, "PREPARATION AND CHARECTERIZATION OF TETRAETHYLENEPENTAMINE IMPREGNATED ACTIVATED CARBON FOR CO₂ CAPTURE" was carried out by Swayam Prakash Nanda, Rabindra Murmu, Sanjeet Lakra 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 2022-23. 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.


17/05/23
Guide Signature


17/05/23
HOD Signature


17/05/23
External Signature



Department of Chemical Engineering
Indira Gandhi Institute of Technology
Sarang, Dhenkanal, Odisha-759146

CERTIFICATE

This is to certify that the project report entitled "**Fabrication of P^H device**" is a bona fide record of work submitted by Suhana Naik, Sushree Sangita Sahu, Adyarashmi Mohanty, Sandhyarani Malik under the guidance of **Mr. Kashinath Barik**. It is submitted in partial fulfilment of the requirement for the award of BACHELOR OF TECHNOLOGY in Chemical engineering, Indira Gandhi Institute of technology, Sarang, Odisha.


.....
19/05/23

HOD
Chemical Department


.....
19/05/23

Signature of External


.....

Mr. Kashinath Barik
Assistant Professor
Chemical Department



Department of Chemical Engineering
Indira Gandhi Institute of Technology
Sarang, Dhenkanal, Odisha-759146

CERTIFICATE

This is to certify that the project report entitled "Iron Ore Pelletization" is a bona fide record of work submitted by Raturaj Mohanty and Nirmal Sahoo under the guidance of Mr. Kashinath Barik. It is submitted in partial fulfilment of the requirement for the award of BACHELOR OF TECHNOLOGY in Chemical engineering, Indira Gandhi Institute of technology, Sarang, Odisha.

K Barik

.....
Mr. Kashinath Barik

Chemical Department

Barik
17/05/23

.....
External Examiner

h

.....
HOD

Chemical Department

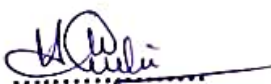


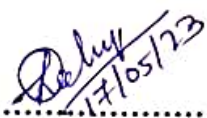
Department of Chemical Engineering
Indira Gandhi Institute of Technology
Sarang, Dhenkanal, Odisha-759146

CERTIFICATE

This is to certify that the project report entitled "Polypropylene and Graphene Nanocomposites: Effect of Selected 2D-Nanofiller's Plate Sizes on the Physicochemical Properties" is a bonafide record of work submitted by A. Vishnu Reddy, Sandeep Samal, Saiprasad Biswal, Anish Bera, Ashish Gouda, Sujit Dutta under the guidance of **Dr. Harekrushna Sutar**. It is submitted in partial fulfilment of the requirement for the award of bachelor of technology in Chemical engineering, Indira Gandhi Institute of technology, Sarang, Odisha.


.....
Dr. Dipa Das
HOD
Chemical Department


.....
Dr. Harekrushna Sutar
Assistant Professor
Chemical Department


.....
External Signature
Chemical Department



INDIRA GANDHI INSTITUTE OF TECHNOLOGY, SARANG

CERTIFICATE

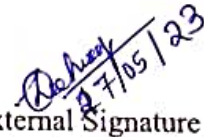
This is to certify that the major project report entitled "Microbial degradation of polythene using aspergillus microorganism" Submitted by Sourav Kumar Sahoo, Rahul Behera, Dibyagyani Bisoyi, Monalisha Sahoo, Subhashree Simran Mishra, Arpita Mahalik under the guidance of Mr. Pranab Kumar Mahalik in 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 disbursed by them under my supervision and guidance in the academic session 2019-2023.


17.05.2023

Guide Signature


17/05/23

HOD Signature


17/05/23

External Signature