

Visvesvaraya Technological University
Belagavi, Karnataka-590 018

2019-2020



Project Report
(15MNP85)

on

**“WIRELESS COMMUNICATION & TRACKING SYSTEM FOR
UNDERGROUND MINES”**

Submitted in partial fulfillment of the requirement for the VIII semester
Project work – 15MNP85 for the award of the degree of

Bachelor of Engineering

in

Mining Engineering

By

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DHRUV LODHA	1GV16MI010
JEFFIN THOMAS	1GV16MI015
TAMIZH SELVAN D	1GV16MI033

Under the Guidance of
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Associate Professor,
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Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY

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Certified that the Project work entitled "*Wireless Communication & Tracking System for Underground Mines*" is a bona fide work carried out by Ajay Sabu (USN-1GV16MI002), Dhruv Lodha (USN-1GV16MI010), Jeffin Thomas (USN-1GV16MI015) and Tamizh Selvan D. (USN-1GV16MI033) in the fulfillment for the award of degree of Bachelor of Engineering in Mining Engineering of the Visvesvaraya Technological University, Belagavi during the year 2019-2020. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The Project Phase-II report has been approved as it satisfies the academic requirement in respect of Project Phase-II (15MNP85) prescribed for the Bachelor of Engineering degree.

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Name of the Examiner

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ABSTRACT

Underground mining involves miners working in a risky and constrained environment where issues like air quality, temperature, humidity, noxious gases etc. is a matter of great concern. To tackle these, wired tele monitoring systems are widely developed in mines. With the advent of wireless technology, wired data acquisition systems are becoming obsolete and are being replaced by their high-speed wireless counterparts. In this project, a data acquisition system has been proposed which uses a Ultra-Wideband (UWB) based wireless sensor network to acquire real time data from sensors placed at strategic points in an underground mine. This system works on Received Signal Strength Index (RSSI) Fingerprint Database, which is range free.

KEYWORDS –

ZigBee, Decawave DW1000, Raspberry Pi, Internet of Things (IoT), Received Signal Strength Index (RSSI), Time of Arrival (ToA), Angle of Arrival (AoA), Time Difference of Arrival (TDoA), Two-Way Ranging, Impulse Radio (IR)

Visvesvaraya Technological University

Belagavi, Karnataka-590 018

2019-2020



**Project Phase-II Report
(15MNP85)**

on

“Gas Monitoring System for Mine Safety using Wireless Sensor”

**Submitted in partial fulfillment of the requirement for the VIII semester
Project work – 15MNP85 for the award of the degree of**

Bachelor of Engineering

in

Mining Engineering

By

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Certified that the Project work entitled “*Gas Monitoring System for Mine Safety using Wireless Sensor*” is a bona fide work carried out by Akash S Gowda (1GV16MI003), Sijith S (1GV16MI028), Raj Kumar R (1GV16MI023), Naveen K (1GV14MI026) in the fulfillment for the award of degree of Bachelor of Engineering in **Mining Engineering** of the Visvesvaraya Technological University, Belagavi during the year 2019-2020. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The Project Phase-II report has been approved as it satisfies the academic requirement in respect of **Project Phase-II (15MNP85)** prescribed for the Bachelor of Engineering degree.

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2019-2020



**Project Phase-II Report
(15MNP85)**

on

“Study of instrumentation on ground control in underground metal mines”

**Submitted in partial fulfillment of the requirement for the VIII semester
Project work – 15MNP85 for the award of the degree of**

Bachelor of Engineering

in

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By

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Certified that the **Project work** entitled "*Study of instrumentation on ground control in underground metal mines*" is a bona fide work carried out by **Akash Kumar S (1GV17MI400), Shashi Kumar V (1GV17MI409), Subash B (1GV17MI410), Venkat Santhosh Kumar (1GV17MI413)** in the fulfillment for the award of degree of Bachelor of Engineering in **Mining Engineering** of the **Visvesvaraya Technological University, Belagavi during the year 2019-2020**. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The Project Phase-II report has been approved as it satisfies the academic requirement in respect of **Project Phase-II (15MNP85)** prescribed for the Bachelor of Engineering degree.

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2019-2020



Project Report
(15MNP85)

on

**“INVESTIGATION ON OPTIMUM DESIGN OF DUMP STABILITY IN
REDDI MINES”**

Submitted in partial fulfillment of the requirement for the VIII semester
Project work – 15MNP85 for the award of the degree of
Bachelor of Engineering

in

Mining Engineering

By

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Visvesvaraya Technological University

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2019-2020



**Project Report
(15MNP85)**

on

**“Detection And Alerting Dust, Temperature, Humidity And Hazardous
Gas To Workers Using Sensors”**

Submitted in partial fulfillment of the requirement for the VIII semester
Project work – 15MNP85 for the award of the degree of
Bachelor of Engineering

in

Mining Engineering

By

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SADASHIV BASAVARAJ LACHYAN	1GV16MI025
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Certified that the Project work entitled "*Detection And Alerting Dust, Temperature, Humidity And Hazardous Gas To Workers Using Sensors*" is a bonafide work carried out by Ghouse Mohiddin M (1GV16MI012), Manikanta A (1GV16MI018), Sadashiv Basavaraj Lachyan (1GV16MI025), Nagaraj (1GV17MI404) in the fulfillment for the award of degree of Bachelor of Engineering in Mining Engineering of the Visvesvaraya Technological University, Belagavi during the year 2019-2020. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The Project report has been approved as it satisfies the academic requirement in respect of Project Work(15MNP85) prescribed for the Bachelor of Engineering degree.

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Visvesvaraya Technological University
Belagavi, Karnataka-590 018

2019-2020



A Project Report

on

“STUDY OF SAFETY MANAGEMET PLAN IN NLCIL”

Submitted in partial fulfillment of the requirement for the VIII semester
Project Work– 15MNP85 for the award of the degree of

Bachelor of Engineering

in

Mining Engineering

By

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Certified that the **Project Work** entitled "*Study of Safety Management Plan in NLCIL*" is a bonafied work carried out by **Balamurugan R (USN-1GV14MI011)**, **Gopala Krishnan S (USN-1GV14MI016)**, **Hariharan R (USN-1GV14MI018)** and **Logesh V (USN-1GV14MI024)** in the fulfillment for the award of degree of Bachelor of Engineering in **Mining Engineering** of the **Visvesvaraya Technological University, Belagavi** during the year **2019-2020**. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The project has been approved as it satisfies the academic requirement in respect of **Project Work-15MNP85** prescribed for the Bachelor of Engineering degree.

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ABSTRACT

Safety is an essential tool to run an industry in efficient a way. A proper Mine Management is required to run a mine with safety of men and machinery with a view of Zero Harm. Regulations have become stronger now a days in view of safer running of mines. By the analysis of possibilities of hazard in a mine and taking corrective actions, accident can be minimized to an extent and safer working atmosphere can be ensured. From this study, a proper Safety Management Plan to run an open cast mines safely with a concept of Zero Harm as per CMR 2017(104) is described in brief by taking NLCIL (Mine-1) mines as an example and how to utilize it in a front-end website is explained.

Visvesvaraya Technological University

Belagavi, Karnataka-590 018

2019-2020



**Project Report
(15MNP85)**

on

**"IOT BASED POWER LINE COMMUNICATION IN UNDERGROUND
COAL MINES"**

**Submitted in partial fulfillment of the requirement for the VIII semester
Project work – 15MNP85 for the award of the degree of
Bachelor of Engineering**

in

Mining Engineering

By

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Certified that the Project work entitled “*IoT Based Power Line Communication in Underground Coal Mines*” is a bona fide work carried out by **Kuenga Choden (1GV16MI017), Ranjith L.N (1GV16MI024), Lalnunsiam Fanai (1GV15MI065), Sanjay Kumar S (1GV15MI047)** in the fulfillment for the award of degree of Bachelor of Engineering in **Mining Engineering** of the **Visvesvaraya Technological University, Belagavi** during the year **2019-2020**. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The Project report has been approved as it satisfies the academic requirement in respect of **Project Phase-II (15MNP85)** prescribed for the Bachelor of Engineering degree.

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2019-2020



**Project Report
(15MNP85)**

on

“Preliminary Characterization Study of Lignite MINE-1A Coal ”

**Submitted in partial fulfillment of the requirement for the VIII semester
Project work – 15MNP85 for the award of the degree of**

Bachelor of Engineering

in

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Certified that the Project work entitled "*Preliminary Characterization Study of Lignite Mine-1A Coal*" is a bonafide work carried out by Gurubalan B (1GV15MI012), Peter alphonse M (1GV15MI029), Rohan P (1GV15MI044), Vishnu devan N (1GV15MI070) in the fulfillment for the award of degree of Bachelor of Engineering in Mining Engineering of the Visvesvaraya Technological University, Belagavi during the year 2019-2020. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The Project Phase-II report has been approved as it satisfies the academic requirement in respect of Project Phase-II(15MNP85) prescribed for the Bachelor of Engineering degree.

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Visvesvaraya Technological University

Belagavi, Karnataka-590 018

2019-2020



A Project Report

on

“ZERO DEGREE TURNING DUMPER”

**Submitted in partial fulfillment of the requirement for the VII semester
Project Work– 15MNP78 for the award of the degree of**

Bachelor of Engineering

in

Mining Engineering

By

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Certified that the Project Work entitled "*Zero Degree Turning Dumper*" is a bonafied work carried out by TAMILARASAN P (USN-1GV14MI041), POOVILISELVAN S (USN-1GV15MI031), PREM K (USN-1GV15MI034) and RAJKUMAR M D (USN-1GV15MI041) in the fulfillment for the award of degree of Bachelor of Engineering in Mining Engineering of the Visvesvaraya Technological University, Belagavi during the year 2019-2020. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The project has been approved as it satisfies the academic requirement in respect of Project Work-15MNP78 prescribed for the Bachelor of Engineering degree.



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Visvesvaraya Technological University

Belagavi, Karnataka-590 018

2019-2020



**Project Report
(15MNP85)**

on

“The Prevention and Control of Fire in Underground Coal Mines”

**Submitted in partial fulfillment of the requirement for the VIII semester
Project work – 15MNP85 for the award of the degree of**

Bachelor of Engineering

in

Mining Engineering

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Certified that the Project work entitled “*The Prevention and Control of Fire in Underground Coal Mines*” is a bona fide work carried out by RAJESH.R (1GV15MI040), SATHYAN. K (1GV16MI407), RAJA.J (1GV17MI406), SHALOM.R (1GV17MI408) in the fulfillment for the award of degree of Bachelor of Engineering in Mining Engineering of the Visvesvaraya Technological University, Belagavi during the year 2019-2020. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The Project Phase-II report has been approved as it satisfies the academic requirement in respect of Project Phase-II (15MNP85) prescribed for the Bachelor of Engineering degree.

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ABSTRACT

This paper describes the analysis of prevention and control of mine fires and explosion in underground coal mines, while in opencast mines are generally known to be safer than the underground mines, underground coal mines are more prone to underground fires, this is due to fact that coal itself is a combustible matter and underground coal fires can cease the mining operation, machines should be fitted with interlock devices to prevent operation of the cutting element, due to spontaneous heat etc, we are faced with many dangerous problems, therefore the assessment of this problem as this necessary and hence we are trying to calculate and predict how susceptible or prone any coal might be towards any type of heating.

Visvesvaraya Technological University

Belagavi, Karnataka-590 018

2019-2020



**Project Phase-II Report
(15MNP85)**

on

**“Feasibility of Extraction of Locked up ore in the Opencast Benches by
Innovative Method”**

**Submitted in partial fulfillment of the requirement for the VIII semester
Project work – 15MNP85 for the award of the degree of
Bachelor of Engineering**

in

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By

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Certified that the Project work entitled "*Feasibility of Extaction of Locked up ore in the Opencast benches by Innovative Methods*" is a bona fide work carried out by Rajaprabhu A (1GV14MI032), Manish D Y (1GV15MI022), Sudharshan R (1GV17MI411), Syed Nizamuddin G M (1GV16MI411) in the fulfillment for the award of degree of Bachelor of Engineering in Mining Engineering of the Visvesvaraya Technological University, Belagavi during the year 2019-2020. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The Project Phase-II report has been approved as it satisfies the academic requirement in respect of Project Phase-II (15MNP85) prescribed for the Bachelor of Engineering degree.

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Visvesvaraya Technological University
Belagavi, Karnataka-590 018

2019-2020



A Project Report

on

“ROCK SLOPE STABILITY AND MONITORING”

Submitted in partial fulfillment of the requirement for the VII semester
Project Work– 15MNP85 for the award of the degree of
Bachelor of Engineering

in

Mining Engineering

By

PUGAZHVENDHAN.K	1GV15MI035
SARAVANAN.C.N	1GV15MI048
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Certified that the Project Work entitled "**ROCK SLOPE STABILITY AND MONITORING**" is a bonafiedwork carried out by **PUGAZHVENDHAN.K (USN-1GV15MI035), SARAVANAN.C.N(USN-1GV15MI048), THAMARAIVANNAN.J (USN-1GV15MI055), ROHITH.C (USN-1GV15MI072)** in the fulfillment for the award of degree of Bachelor of Engineering in Mining Engineering of the Visvesvaraya Technological University, Belagavi during the year 2019-2020. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The project has been approved as it satisfies the academic requirement in respect of **Project Work-15MNP85** prescribed for the Bachelor of Engineering degree.

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ABSTRACT

Mining activities affect stress conditions within slopes thereby making them susceptible to deform over a period of time. Slope stability analysis is important in all engineering projects involving slopes, either natural or man-made. A slope failure in a working area can lead to significant economic losses and has immense impact on safety of personnel. The aim of the study described in this paper is to analyze and monitor the stability of slopes by investigating the factor of safety obtained through the Slide Software. In the case of temporary slopes, the only way by which the slope failure can be prevented is by reducing the slope angle. In such cases, this technique provides additional volume of material to be excavated and the additional cost likely to be incurred from it varies with the slope angle. Numerical modelling is a very versatile tool and enables us to simulate failure behaviour in deforming materials. The relations between factor of safety and parameters such as unit weight, angle of internal friction, cohesion and berm width are analyzed in this paper. Proper monitoring should be carried out using various monitoring instruments such as tilt meters, inclinometers etc .

Key words: Slope stability, factor of safety, angle of internal friction, slope failure, slide software.

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2019-2020



**Project Report
(15MNP85)**

on

“EFFECTS OF MACHINE VIBRATIONS ON OPERATORS”

**Submitted in partial fulfillment of the requirement for the VIII semester
Project work – 15MNP85 for the award of the degree of**

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Mining Engineering

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TYCHICUS AUGUSTIN 1GV17MI412

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**Project Phase-II Report
(15MNP85)**

on

“Assessment of Slope Stability in Iron Ore Mines”

**Submitted in partial fulfillment of the requirement for the VIII semester
Project work – 15MNP85 for the award of the degree of**

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in

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CERTIFICATE

Certified that the Project work entitled "*Assessment of Slope Stability in Iron Ore Mines*" is a bonafied work carried out by Arun Kumar S (1GV16MI005), Karthick S (1GV16MI016), Surya T (1GV16MI032), Vivek Paul D (1GV16MI036) in the fulfillment for the award of degree of Bachelor of Engineering in Mining Engineering of the Visvesvaraya Technological University, Belagavi during the year 2019-2020. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The Project Phase-II report has been approved as it satisfies the academic requirement in respect of Project Phase-II (15MNP85) prescribed for the Bachelor of Engineering degree.

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