Walchand Institute of Technology

**Electronics & Telecommunication Engineering**

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| Group No: |
| B3-G1 |

Project Evaluation Booklet

**Project Details**

**Title: IoT Based Safety, Monitoring and Alerting system for Mines**

**Category (Application, Product, Research, Review etc.):**

**Brief information about project:**

The mining industry is highly dangerous, with thousands of worker deaths each year. Outdated technology and mismanagement contribute to problems such as explosions and toxic gas leaks in coal mines. China has experienced some of the deadliest mining incidents, including the Honkeiko Colliery coal explosion that killed 1,549 miners. Ensuring mine worker safety is challenging, leading to the adoption of IoT for monitoring. IoT connects devices and stores data in the cloud for easy access. Europe is a leader in essential IoT gadgets, covering areas like smart housing, transportation, and cities.

A wireless wearable working unit has been developed to enhance the safety of workers in underground mines. The unit consists of a transmitter with sensors, a receiver, and a main control unit. The Arduino NANO microcontroller receives and processes data from sensors, transmitting it to a designated receiver for analysis and action. If parameters exceed thresholds or flames are detected, immediate alerts are sent to the control room and workers. Essential sensors monitor temperature, humidity, and gas levels to provide early warnings and mitigate risks. The system utilizes IoT technology and integrates multiple sensors and controllers for improved worker safety in the mining industry.

**Objectives:**

The project aims to design a real-time monitoring system using Zigbee technology for improved mines safety. The system will detect and identify toxic gas leaks in mining environments, allowing for timely preventive measures. Our objective in designing this system is as follows:

* Detection of different toxic gases and other factors within mining environment
* Communication establishment between sensors and Zigbee
* Establishment of Wireless Sensor Network
* Design of a real-time monitoring system

**Expected Outcome:**

The “IoT Based Safety, Monitoring and Alerting system for Mines” project is the development of a wireless wearable working unit for enhancing worker safety in underground mines. The unit consists of a transmitter, receiver, and main control unit, along with sensors to monitor the environment. The system will provide real-time alerts for emergencies and hazardous conditions. By continuously monitoring parameters like temperature, humidity, and gas levels, the system aims to provide early warnings and ensure the safety of coal mine workers. The integration of IoT technology and sensors will offer a comprehensive solution for addressing the safety needs in the mining industry.

**Usability (Application):**

* Worker Safety: The system monitors temperature, humidity, and hazardous gases in mines to ensure worker safety. It sends real-time alerts for immediate action and evacuation if needed.
* Emergency Response: The system detects emergencies such as fires, gas leaks, or collapses and promptly alerts the control room and emergency services for faster and more effective rescue operations.
* Remote Monitoring and Control: The system enables remote monitoring and control of mine processes and equipment, facilitating informed decision-making and operational optimization from a centralized location.
* Data Analytics and Predictive Maintenance: The system's collected data enables advanced analytics for predictive equipment maintenance, pattern identification, and process optimization, leading to increased productivity and safety in mining operations.

**Group Members:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Name** | **Div& Roll No** | **Mobile Number & E-mail** |
| 1 | Pranav Sonar | BE(ENTC II) - 19 | 9922388742 | pranavsonar07@gmail.com |
| 2 | Pooja Thakur | BE(ENTC II) –  20 | 7798661314 | poojathakur733@gmail.com |
| 3 | Chandrashekhar Yemul | BE(ENTC II) –  21 | 8668248827 | chandrashekaryemul09@gmail.com |

**Guide Name: Sign:**

**Prof . K. R. Biradar**

**Project Evaluation: Semester-I**

# Project Synopsis/Proposal Evaluation (Rubric R1)-10 Marks

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| --- | --- | --- | --- |
| **Parameter to be evaluated** | **Examiner I** | **Examiner II** | **Examiner III** |
| Identification of Problem Domain |  |  |  |
| Detailed analysis of Feasibility |  |  |  |
| Objectives and Methodology of Project Proposal |  |  |  |
| Total score |  |  |  |

**Average Score: 26 (out of 30)**

**Evaluation Score out of 10: 09**

**Corrections/Modifications:**

* Make the Flow Chart more elaborative.

**Any other suggestions:**

* No

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| --- | --- | --- |
| (Mr. K.R.Biradar) | (Mr. S. V. Aursang) | (Mr. Virupaksha B) |
| Examiner I  Name & Sign | Examiner II  Name & Sign | Examiner III  Name & Sign |

**1st Mid-sem Project Evaluation (Rubric R2)-30 Marks**

1. **Team Work Assessment**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter to be evaluated** | | **Examiner I** | **Examiner II** | **Examiner III** |
| **Design Methodology** | **Division of problem (10)** |  |  |  |
| **Design methodology and its justification (10)** |  |  |  |
| **Planning of Project Work** | **Time frame(10)** |  |  |  |
| **Presentation** | **Contents** |  |  |  |
| **Sub Total score: Team work** | |  |  |  |
| **Average (A) out of 40** | |  | | |

1. **Individual Assessment of student**

Parameter to be evaluated: Demonstration and Presentation

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| --- | --- | --- | --- |
| Student Examiner | Roll No.  19 | Roll No.  20 | Roll No.  21 |
| Examiner I |  |  |  |
| Examiner II |  |  |  |
| Examiner III |  |  |  |
| Average (B): Individual Assessment (Out of 10) |  |  |  |

**Total (Rubric R2)-30 Marks**

|  |  |  |  |
| --- | --- | --- | --- |
| Evaluation | Students Roll. No. | | |
|  |  |  |
| Total (A+B) out of 50 |  |  |  |
| Evaluation Score out of 30 |  |  |  |

**Corrections/Modifications:**

* Include Project time line chart for each stage of methodology.
* Give detailed methodology in PowerPoint presentation.

**Any other suggestions:**

Nil

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| (Mr. K.R.Biradar) | (Mr. S. V. Aursang) | (Mr. Virupaksha B) |
| Examiner I  Name & Sign | Examiner II  Name & Sign | Examiner III  Name & Sign |

**Evaluation by Guide(Rubric R3)-10 Marks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter to be evaluated** | **Students Roll. No.** | | | |
| **19** | **20** | **21** |  |
| Technical Knowledge and Awareness related to the Project |  |  |  |  |
| Regularity and Attendance |  |  |  |  |
| Total score (out of 20) |  |  |  |  |
| Evaluation Score (out of 10) |  |  |  |  |

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**Project Evaluation: Semester-I**

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| **Review** | **Agenda** | **Assessment**  **Rubric** | **Total Evaluation**  **Marks** | **Marks obtained** | | |
| **Roll.**  **No**  **19** | **Roll.**  **No**  **20** | **Roll.**  **No**  **21** |
| **Review 1** | Project Synopsis / Proposal Evaluation | Rubric R1 |  |  |  |  |
| **Review 2** | 1st Mid-Term Project Evaluation | Rubric R2 |  |  |  |  |
| Evaluation by Guide | Rubric R3 |  |  |  |  |
| Total Marks | | | |  |  |  |

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| **ICA** | | | |
| **Semester –I (Marks out of 50)** | | | |
| **Roll. No.** |  |  |  |
| **Marks (50)** |  |  |  |
| **Marks (25)** |  |  |  |

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**Project Evaluation: Semester-II**

**2nd mid sem Project Evaluation (Rubric R4 )-30 Marks**

1. **Team Assessment**

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| **Parameter to be evaluated** | | **Examiner I** | **Examiner II** | **Examiner III** |
| **Incorporation of Suggestions** | |  |  |  |
| **Project Demonstration** | 10 |  |  |  |
| 10 |  |  |  |
| 10 |  |  |  |
| **Presentation: Contents** | |  |  |  |
| **Total score(A)** | |  |  |  |
| Average Total (A) out of 50 | |  | | |

1. **Individual Assessment of student**

**Parameter to be evaluated:** Presentation

|  |  |  |  |
| --- | --- | --- | --- |
| **Students Roll. No**  **Examiner** | **19** | **20** | **21** |
| **Examiner I** |  |  |  |
| **Examiner II** |  |  |  |
| **Examiner III** |  |  |  |
| Average (B) out of 10 |  |  |  |

**Total (Rubric R4)- 30 Marks**

|  |  |  |  |
| --- | --- | --- | --- |
| Evaluation | **Students Roll. No.** | | |
| **19** | **20** | **21** |
| Total (A+B) out of 60 |  |  |  |
| Evaluation Score out of 30 |  |  |  |

**Incorporation of suggestions:**

* Nil

**Corrections/Modifications:**

* Nil

**Any other suggestions:**

* Nil

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| --- | --- | --- |
| (Mr. K.R.Biradar) | (Mr. S. V. Aursang) | (Mr. Virupaksha B) |
| Examiner I  Name & Sign | Examiner II  Name & Sign | Examiner III  Name & Sign |

**End Semester Internal Project Evaluation (Rubric R5)-30 Marks**

1. **Team Assessment**

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| --- | --- | --- | --- | --- |
| **Parameter to be evaluated** | | **Examiner I** | **Examiner II** | **Examiner III** |
| **Incorporation of Suggestions** | |  |  |  |
| **Project Demonstration** | 10 |  |  |  |
| 9 |  |  |  |
| 9 |  |  |  |
| **Presentation: Contents** | |  |  |  |
| **Total score(A)** | |  |  |  |
| Average Total (A) out of 50 | |  | | |

1. **Individual Assessment of student**

Parameter to be evaluated: Presentation

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| **Students Roll No.**  **Examiner** | **19** | **20** | **21** |  |
| **Examiner I** |  |  |  |  |
| **Examiner II** |  |  |  |  |
| **Examiner III** |  |  |  |  |
| Average (B): Individual Assessment out of 10 |  |  |  |  |

**Total (Rubric R5)- 30 Marks**

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| --- | --- | --- | --- | --- |
| Evaluation | **Students Roll. No.** | | | |
| **19** | **20** | **21** |  |
| Total (A+B) out of 60 |  |  |  |  |
| Evaluation Score out of 30 |  |  |  |  |

**Incorporation of suggestions:**

**NA**

**Corrections/Modifications:**

**NA**

**Any other suggestions:**

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| --- | --- | --- |
| (Mr. K.R.Biradar) | (Mr. S. V. Aursang) | (Mr. Virupaksha B) |
| Examiner I  Name & Sign | Examiner II  Name & Sign | Examiner III  Name & Sign |

**Project Report Evaluation(Rubric R6)-30 Marks**

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| --- | --- | --- | --- | --- |
| **Parameter to be evaluated** | | **Examiner I** | **Examiner II** | **Examiner III** |
| **Project Report** | **Format** |  |  |  |
| **References and Citation** |  |  |  |
| **Description of Concepts and Technical Details** | |  |  |  |
| **Conclusion and Discussion** | **Results** |  |  |  |
| **Conclusions** |  |  |  |
| **Future scope/**  **extension** |  |  |  |
| **Total score** | |  |  |  |
| **Average Score** | |  | | |
| **Score out of 30** | |  | | |

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| --- | --- | --- |
| (Mr. K.R.Biradar) | (Mr. S. V. Aursang) | (Mr. Virupaksha B) |
| Examiner I  Name & Sign | Examiner II  Name & Sign | Examiner III  Name & Sign |

**Evaluation by Guide(Rubric R7) -10 Marks**

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| --- | --- | --- | --- | --- |
| **Parameter to be evaluated** | **Students Roll. No.** | | | |
| **19** | **20** | **21** |  |
| Technical Knowledge and Awareness related to the Project |  |  |  |  |
| Regularity and Attendance |  |  |  |  |
| Total score (out of 20) |  |  |  |  |
| **Evaluation Score (out of 10)** |  |  |  |  |

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**Project Evaluation- Semester-II**

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| **Review** | **Agenda** | **Assessment**  **Rubric** | **Total Evaluation**  **Marks** | **Marks obtained** | | | |
| **Roll.**  **No 19** | **Roll.**  **No 20** | **Roll.**  **No 21** |  |
| **Review3** | 2nd Mid-Term Project Evaluation | Rubric R4 | 30 |  |  |  |  |
| **Review4** | End Semester Internal Project Evaluation | Rubric R5 | 30 |  |  |  |  |
| Project Report Evaluation | Rubric R6 | 30 |  |  |  |  |
| Evaluation by Guide | Rubric R7 | 10 |  |  |  |  |

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| **ICA** | | | |
| **Semester –II (Marks out of 100)** | | | |
| **Roll.**  **No 19** | **Roll.**  **No 20** | **Roll.**  **No 21** |  |
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**Further Development/ Continuance of this Project**

In future it can be used in public places such as amusement parks, IT companies, Jails, etc to keep a record of people present at the venue.

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