3.2.1 Institution has created an ecosystem for innovations and has initiatives for creation and transfer of knowledge Response

The institution fosters a supportive environment to promote innovation and incubation. Students are motivated to engage in technological advancements that address both societal and industrial needs. Comprehensive facilities for documentation, research publication, and patent acquisition are made available to nurture innovative ideas.

Regular workshops, seminars, and guest lectures are organized to expose students to emerging trends and provide opportunities to interact with industry experts. The institution's Incubation Center offers mentorship and resources, enabling students to transform their ideas into practical technological solutions, with a particular focus on renewable energy and sustainable development.

The primary goal of the Incubation Center is to inspire students to develop advanced technologies that address real-world challenges. Students are encouraged to participate in idea generation competitions, prototype development programs, and other initiatives, equipping them with the skills necessary for innovation and product commercialization.

These efforts have led to significant outcomes, showcasing the institution's commitment to fostering creativity and technological progress.

Some of the outcomes of these initiatives include:

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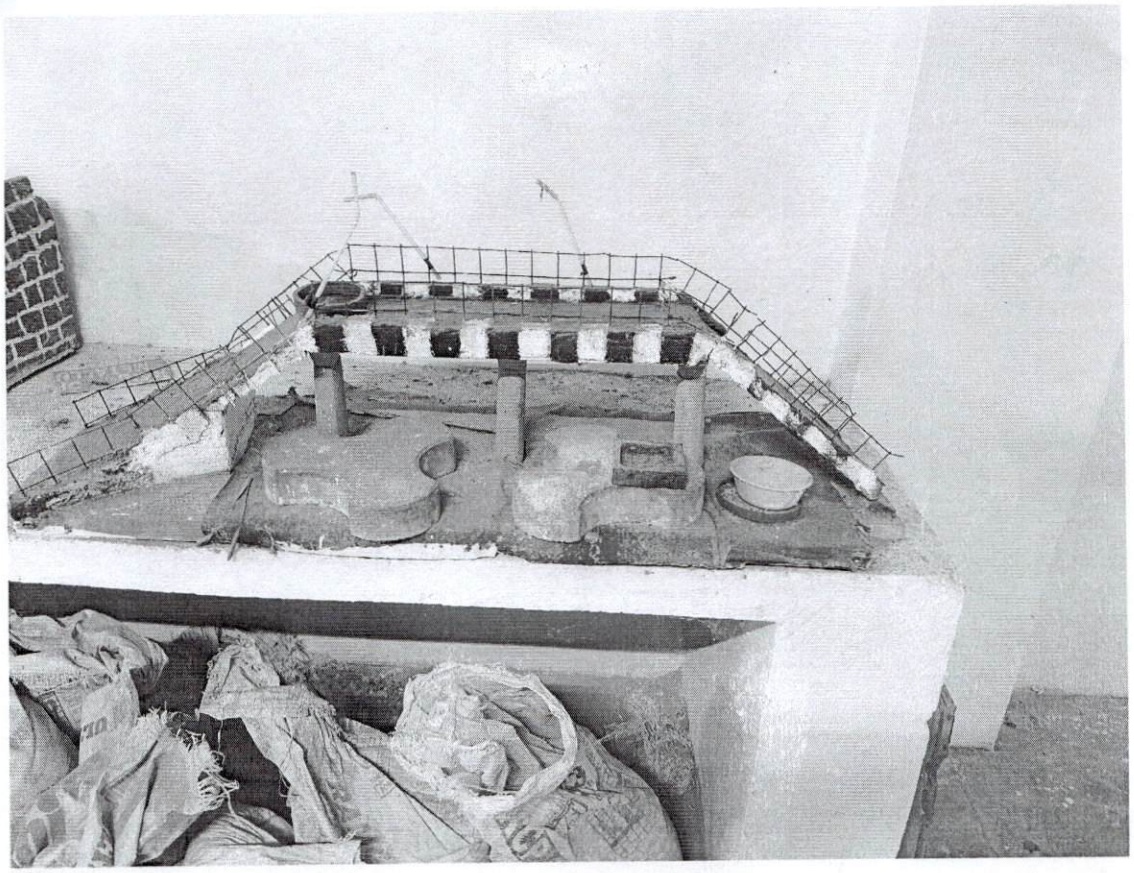
Ph : 0866-2469201, 202, 204 Fax : 0866-2469203
E-mail : principal.vcet@gmail.com, website : http:// www.vikasinstitutionsnunna.org/

Project Proposal: Development of a Flyover for Enhanced Campus Connectivity



The prototype

1. Project Title

Development of a Flyover

2. Executive Summary

This project aims to design and construct a flyover within the university premises to improve connectivity, ensure student safety, and optimize traffic flow. With growing student and faculty numbers, pedestrian and vehicular congestion on campus roads has become a significant concern. The flyover will address these challenges, facilitating smoother movement and enhancing the overall infrastructure of the university.

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3. Objectives

1. **Enhance Campus Connectivity:** Create a direct, time-efficient pathway between major areas of the campus.

2. **Improve Safety:** Minimize pedestrian-vehicle interaction, reducing accident risks.

3. **Optimize Traffic Flow:** Address congestion by separating pedestrian and vehicular movement.

4. **Promote Infrastructure Development:** Modernize the campus with sustainable and user-friendly infrastructure.

4. Background and Rationale

The growing student population and increased vehicular activity have led to significant congestion in key areas of the campus, particularly during peak hours. This not only hinders productivity but also poses safety risks to pedestrians. The absence of a designated overhead passageway has resulted in delays, inconvenience, and occasional accidents.

A flyover presents a strategic solution, leveraging modern engineering to address these issues while complementing the university's long-term development goals.

5. Scope of Work

1. **Feasibility Study:** Conduct surveys to identify optimal location and design specifications.

2. **Design and Planning:** Collaborate with architects and civil engineers to create a sustainable, aesthetically pleasing design.

3. **Construction:** Execute the construction using eco-friendly materials and techniques.

4. **Safety Features:** Integrate handrails, lighting, and ramps for accessibility.

5. **Monitoring and Maintenance:** Establish a system for regular maintenance and performance assessment.

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8. Expected Outcomes

1. **Reduced Travel Time:** Streamlined movement between key campus areas.
2. **Increased Safety:** A significant drop in pedestrian-vehicle incidents.
3. **Enhanced Campus Appeal:** Modern infrastructure enhancing the university's reputation.
4. **Sustainability:** Use of eco-friendly materials to align with green campus goals.

9. Sustainability and Environmental Impact

The project will adhere to sustainability principles, including the use of recycled materials, solar-powered lighting, and environmentally conscious construction methods. Additionally, green spaces will be integrated around the flyover to preserve the natural campus environment.

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Project Report: Model Barrage for Water Flow and Management

Prototype

1. Introduction

This project deals with design, functionality, and analysis of the model barrage . Barrages are critical infrastructure used to regulate river flow, manage water levels, and ensure effective water distribution for irrigation, flood control, and energy generation. The given model demonstrates the key structural and operational components of a barrage in a scaled-down format for study and educational purposes.

2. Description of the Barrage Model

Key Components:

1. **Main Barrage Structure**:

- Constructed using miniature bricks to simulate the masonry used in real-life barrages.
- Includes a central spillway to allow controlled water discharge.

2. **Spillway and Sluice Gate**:

- A sluice gate system is integrated to control water flow. The gate is represented by the vertical rods that can be raised or lowered.
- The spillway directs the water downstream and ensures smooth water flow management.

3. **Upstream and Downstream Channels**:

- The model features an inlet (upstream) and an outlet (downstream) path that simulate river flow.
- The inclined ramp downstream replicates the energy dissipation structures of an actual barrage.

4. **Foundation and Support**:

- The base is designed to provide stability, mimicking the reinforced foundations used in real-life scenarios.
- Made from concrete and metal elements, providing the necessary weight for the scaled-down structure.

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5. **Materials Used**:

- Small-scale bricks, cement, and metal rods.
- Paint applied for aesthetic distinction and clarity in demonstrating sections.

3. Purpose and Application

The model barrage represents a typical structure that can be used in:

1. **Educational Demonstrations**:

- Teaching students about hydrology, fluid mechanics, and water resource management.
- Demonstrating the functioning of sluice gates and spillways.

2. **Design Testing**:

- Testing water flow and flood control mechanisms at a small scale.
- Evaluating energy dissipation techniques on the downstream side.

3. **Structural Prototyping**:

- Serving as a prototype for larger barrages to evaluate material durability and functionality.

4. Functionality

The barrage model is designed to regulate water flow by simulating:

1. **Controlled Water Discharge**:

- The sluice gate allows for adjustable water flow, ensuring water level management upstream.

2. **Flood Prevention**:

- The spillway ensures excess water is released safely, reducing the risk of flooding.

3. **Groundwater Recharge**:

- The regulated flow allows water to seep into surrounding areas, mimicking natural recharge processes.

4. **Irrigation Support**:

- Provides controlled water release to simulate irrigation systems downstream.

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5. Construction Process

1. **Foundation Preparation**:

- A stable base is laid using concrete to support the structure.
- The foundation ensures durability and prevents structural shifts during operation.

2. **Spillway Construction**:

- A slope is created using reinforced cement to mimic the real-life flow dynamics.

3. **Gate Installation**:

- Metal rods represent gates, which can be adjusted to simulate real-time water management.

4. **Finishing Touches**:

- Paint and markings are added to highlight structural details for better demonstration.

6. Maintenance and Recommendations

- **Regular Cleaning**:
- Ensure the spillway and gate systems remain free of debris to simulate proper water flow.
- **Structural Checks**:
- Periodically inspect for cracks or damage to the model to maintain integrity.
- **Improvement Areas**:
- Add small-scale sensors or flow meters for enhanced demonstration of flow dynamics.

7. Conclusion

This model provides a practical and visual understanding of how barrages operate in real-world scenarios. By replicating the fundamental design and functionality of a barrage, it serves as a powerful tool for learning, research, and testing. With some enhancements, this model can also support experimental studies on water management and hydraulic engineering.

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E-mail : principal.vcet@gmail.com, website : http:// www.vikasinstitutionsnunna.org/

Project Proposal: Construction of a Spring House Model for Advanced Structural and Architectural Learning

1. Project Title

Design and Development of a Spring House Model for Structural Engineering Education

2. Executive Summary

This project proposes the development of a **Spring House Model** to demonstrate the principles of seismic resistance, energy absorption, and modern construction techniques. The model highlights how structures can be designed to withstand external forces, such as earthquakes or vibrations, through the integration of spring-based foundations.

The **Spring House** serves as an educational tool to help students and researchers understand advanced concepts in civil engineering and structural dynamics. It also aligns with the institution's commitment to promoting innovation, sustainability, and practical learning.

3. Objectives

1. **Enhance Learning Outcomes:** Provide students with hands-on experience in designing and understanding spring-based shock-absorbing structures.

2. **Promote Innovation in Construction Techniques:** Demonstrate how engineering can mitigate the impact of natural disasters like earthquakes.

3. **Encourage Research:** Serve as a prototype for exploring advanced structural systems.

4. **Sustainability:** Promote eco-friendly design by integrating recyclable materials in the construction of the model.

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4. Description of the Spring House

Key Features:

1. **Shock Absorbing Base:**

• The lower platform incorporates springs that simulate seismic isolation techniques. This allows the structure to absorb vibrations caused by external forces.

2. **Two-Tier Design:**

• The house is constructed on two levels to demonstrate vertical load distribution and the impact of shocks on multi-storey buildings.

3. **Openings for Observation:**

• Strategic placement of windows and openings allows viewers to observe structural responses during demonstrations.

4. **Materials Used:**

• The model uses lightweight materials such as wood, springs, and metal reinforcements to replicate real-world construction with scale considerations.

5. **Aesthetic and Functional Design:**

• The top-level represents a functional living space, while the lower level demonstrates engineering mechanisms such as springs for movement absorption.

5. Scope of Work

4. **Research and Feasibility Study:**

• Study materials, scale design, and load testing for effective demonstration.

2. **Model Construction:**

• Develop the Spring House using durable and eco-friendly materials.

3. **Testing and Demonstration:**

• Conduct live demonstrations to evaluate the model's performance under simulated seismic conditions.

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AI Crop Whisperer: Smart Agriculture with IoT

Objective: To modernize agricultural practices by integrating Artificial Intelligence (AI) and Internet of Things (IoT) technologies. It enables real-time monitoring of crops and environmental factors to optimize agricultural productivity.

Description: The system employs sensors to collect data on soil moisture, temperature, and other environmental parameters, which are analyzed using AI algorithms to provide actionable insights. The IoT framework ensures seamless data transmission and remote monitoring capabilities.

Outcome: The project successfully developed a prototype that demonstrated significant potential for improving farming efficiency and reducing resource wastage.

Funding: The project was funded by the college with an amount of ₹7,000.

Smart Traffic Control Using Arduino

Objective: To address traffic congestion and streamline vehicle movement using a smart, Arduino-based traffic control system.

Description: The project incorporates sensors and microcontrollers to dynamically monitor and manage traffic flow. The system can prioritize emergency vehicles and adjust signals in real-time based on traffic density.

Outcome: The developed model showed promising results in simulations, proving its effectiveness in reducing traffic congestion and enhancing road safety.

Funding: The project was funded by the college with an amount of ₹7,000.

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Sky Patrol: Autonomous Surveillance Drones with IoT and AI

Objective: To design and develop an autonomous surveillance system using drones integrated with AI and IoT for security and monitoring purposes.

Description: The drones are equipped with cameras and AI-powered algorithms for object detection and tracking. IoT integration allows for remote operation and real-time data sharing. This project is designed for applications in border security, disaster management, and industrial surveillance.

Outcome: The team created a fully functional prototype that highlighted the feasibility of autonomous surveillance using advanced technologies

Funding: The project was funded by the college with an amount of ₹8,000

Voice-Controlled Wireless Electronic Notice Board Using Arduino and Android

Objective: To simplify the process of sharing notices and announcements within institutions using voice commands and wireless communication.

Description: The project uses an Arduino microcontroller and an Android interface to enable seamless operation of a wireless electronic notice board. Voice commands are processed to display the required information instantly.

Outcome: The system was successfully tested and proved to be user-friendly and efficient in improving communication within the institution.

Funding: The project was funded by the college with an amount of ₹7,000.

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Intelligent Home: AI-Driven Automation with IoT

Objective: To create a smart home system that integrates AI and IoT technologies for automating household tasks and enhancing security.

Description: This project leverages AI for decision-making and IoT for device interconnectivity. The system can control lights, appliances, and security cameras through a centralized application, making home management more convenient.

Outcome: A prototype was developed and demonstrated, showcasing its capability to improve energy efficiency and user convenience.

Funding: The project was funded by the college with an amount of ₹7,000.

Smart Wallet: AI-Infused IoT Devices for Financial Security

Objective: To enhance financial security by developing a smart wallet equipped with IoT and AI features.

Description: The wallet is integrated with GPS for location tracking and AI for security alerts, ensuring protection against theft or loss. It also supports smart payment options for user convenience.

Outcome: The prototype was successfully developed and tested, providing a practical solution for personal financial security.

Funding: The project was funded by the college with an amount of ₹8,000.

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Construction of Automatic College Bell with Announcement System Using IoT

Objective: To automate the college bell system and integrate it with an announcement mechanism for better efficiency.

Description: The system uses IoT technology to schedule and operate bells automatically while enabling real-time announcements through a centralized control panel.

Outcome: The project demonstrated significant potential in improving operational efficiency within the institution.

Funding: The project was funded by the college with an amount of ₹8,000.

IoT-Based Face Recognized Robot

Objective: To develop a robotic system with face recognition capabilities using IoT for advanced security applications.

Description: The robot employs AI-powered face recognition algorithms to identify individuals and perform specific tasks based on programmed commands. IoT ensures seamless connectivity and remote access.

Outcome: The project delivered a functional robot prototype that showcased the effectiveness of face recognition in real-world scenarios.

Funding: The project was funded by the college with an amount of ₹7,000.

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IoT Smart Parking System

Objective: To address parking challenges in urban areas by creating a smart parking management system using IoT.

Description: The system employs sensors to detect vacant parking spots and communicates this information to users via a mobile application, ensuring efficient utilization of parking spaces.

Outcome: The prototype successfully demonstrated the capability to reduce parking-related issues and improve user convenience.

Funding: The project was funded by the college with an amount of ₹8,000.

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