DRIEMS POLYTECHNIC
TANGI, CUTTACK

PROJECT PROPOSAL FORM

ACADEMIC YEAR 2024-2025

DEPARTMENT OF CSE **ENGINEERING**

SEMESTER: 5th **SECTION:** A **GROUP NO:** 8

NAME OF THE PROJECT GUIDE: Jyoti Ranjan Nayak

DATE: _____

PROJECT TOPIC:
Robotic Arm

MAIN FIELD OF STUDY:
Robotics

ABSTRACT:

This project entails the development of a 3D-printed robotic arm, designed using Blender and powered by the ESP32 microcontroller, which integrates advanced IoT capabilities for wireless control and task automation. The ESP32, configured as a Wi-Fi Access Point, enables seamless communication via a WebSocket-based web interface, allowing real-time command execution. The robotic arm is equipped with multiple servo motors that facilitate precise articulation across various axes, including the base, shoulder, elbow, and gripper. Additionally, the system incorporates functionality for motion recording and playback, enabling the execution of repetitive tasks with high accuracy. This project exemplifies technical proficiency in 3D modeling, microcontroller programming, servo control algorithms, and IoT-enabled robotics, demonstrating potential applications in industrial automation, prototyping, and educational robotics.

OBJECTIVES:

- To design and develop a robotic arm controlled by the ESP32 microcontroller, enabling precise manipulation of servos for diverse applications.
- To integrate IoT features for wireless control via a user-friendly web interface, ensuring real-time command execution.
- To implement recording and playback functionality for automated task sequences, enhancing the arm's efficiency and usability in repetitive operations.

METODOLOGY:

Design and develop a robotic arm system powered by the ESP32 microcontroller and servo motors, ensuring precise joint articulation, including base, shoulder, elbow, and gripper movements. Configure the ESP32 as a Wi-Fi Access Point to enable wireless control through a responsive web interface, built using HTML, CSS, and JavaScript. Implement a WebSocket-based communication protocol for real-time, low-latency command transmission and feedback. Include functionalities for motion sequence recording and playback, allowing automated repetitive task execution. The arm's structure is designed in Blender and 3D-printed for modularity and precision. Rigorous testing and optimization ensure reliability, accuracy, and stability under varying conditions.

Resources/components used and its approximate cost: (if required attach extra pages)

[Money Receipt Attached]

COMPUTER USAGE: (Yes/No)
YES

APPROXIMATE BUDGET in (Rs):

PROPOSED BY: (Name of the students with Registration No)

- K Rajtilak (F22026007039)
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Signature of the Project Guide	Signature of the HoD	Signature of the Principal	Signature of the Director (Poly)