

# Maternity Fitness Tracker and Health Monitoring System for Expectant Mothers

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# Abstract

Our project aims to develop a comprehensive maternity fitness tracker wearable and a complementary website with live sessions to support pregnant women in maintaining their health and well-being during pregnancy. The solution addresses the problem of inadequate access to personalised health monitoring and guidance for pregnant women. Through wearable technology and online resources, we seek to empower expectant mothers to track their health, stay active, and receive expert guidance remotely. This innovative solution combines wearable sensors, web app technology, and live online sessions to provide holistic support for maternal health.

## Problem Statement

Pregnant women often face challenges in monitoring their health and staying active during pregnancy. Many lack access to personalised guidance and find it challenging to attend in-person fitness sessions, especially in remote areas. This can lead to health issues during and after pregnancy, impacting the mother and child.

## Aims and Objectives

1. To develop a wearable fitness tracker that monitors vital health metrics for pregnant women, including heart rate and activity levels.
2. To create a user-friendly website with live sessions conducted by certified fitness instructors and healthcare professionals.
3. To enable pregnant women to track their health data and receive personalised recommendations through a web app.
4. To promote an active lifestyle, mental well-being, and informed decision-making during pregnancy.
5. To provide a cost-effective and accessible solution for pregnant women across diverse backgrounds.

## Methodology

## 1. Maternity Fitness Tracker

We will develop a wearable device equipped with sensors to monitor vital signs like heart rate and steps taken. The device will sync data with a web app for real-time monitoring. The “brain” of the fitness tracker will be the Arduino Nano 33 BLE Sense. An advancement on the fitness tracker (the collection and display of vitals real-time) will be to include a machine learning model to offer recommendations to the expectant mother as to the best course to take in ensuring her health and unborn baby’s are protected.

## 2. Live Session Website

We will create a website offering live fitness and health sessions conducted by certified professionals. Users can access these sessions via webinars and interact with instructors. The web app will serve as the central hub for users to track their health metrics, receive personalised recommendations, and connect with the live sessions. It will also provide educational content on pregnancy health. The website will be implemented using React, Express and NodeJS, SQL and No-SQL databases in keeping with the MERN stack.

## Component List (Hardware)

- Maternity Fitness Tracker (1 Arduino Nano 33 BLE Sense): Approx. 6,700 Ksh per unit
- 1 plastic Casing
- 1 5V Battery/ Power Supply

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Our interdisciplinary team combines technical expertise with domain knowledge to create a holistic solution for maternal health. We are excited to contribute to sustainable technologies that support the well-being of expectant mothers and their babies.