Sector:MEDICAL

STUDENT PROJECT SCHEME 2025-2026

Project Proposal On

Smart Healthcare Wearable for Real-Time Fall Detection

Submitted to

TAMIL NADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

(Department of Higher Education, Government of Tamil Nadu)

Submitted by

SAI THRISHIKA.G,

KIRUTHIGA.A.

Under the Supervision of

Mrs. NITHYABHARATHI.S

Assistant Professor,

IFET COLLEGE OF ENGINEERING

(An Autonomous Institution)

Approved by AICTE, New Delhi and Accredited by NAAC & NBA

Affiliated to Anna University, Chennai-25

Gangarampalayam, Villupuram-605 108

APPLICATION FORMAT FOR STUDENT PROJECT PROPOSAL

Please fill all the details in this MS word file. Convert to pdf file, get it approved from the project guide / head of the department and head of your institution. Keep ready the scanned pdf file of 1) Signed Application form 2) Declaration and Endorsement and fill-up the Google Form. Note: Handwritten proposals & multiple entries in Google form will not be accepted.

https://tinyurl.com/TNSCST-SPS-2025

1.	**Project Title: Smart Healthcare Wearable for Real-Time Fall Detection**
2.	**Sector** (strictly choose only one): **Medical**
3.	**Name(s) of project guide(s):** **1. Name: Prof. / Mrs. NITHYABHARATHI.S** **Designation / Department: AP/CSE** **Email id: iniyanthigazh@gmail.com** **Contact No: 7449163194**
4.	**Name of Team Members (Strictly not more than four students in a batch):** *(Type names in Capital Letters as provided in your college)* **Name: SAI THRISHIKA.G** **Year of Studying/Department/Course: IV/CSE/BE** **Email id: saithrishikagopicse@gmail.com** **Mobile No:7200545520** **Name: A. KIRUTHIGA** **Year of Studying/Department/Course: IV/CSE/BE** **Email id: kiruthigaadhavan@gmail.com** **Mobile No:6382780454**
5.	**Institution Details:** **Name of the Institution: IFET COLLEGE OF ENGINEERING** **Institution category: Self Finance** **Address: IFET Nagar, Gangarampalayam** **District: Villupuram** **Pincode:605108**
6.	**Introduction:** A wearable fall detection device is designed to monitor the movements of elderly or mobility-impaired individuals using sensors like accelerometers and gyroscopes. It automatically detects falls and sends real-time alerts to caregivers or healthcare providers, ensuring quick assistance and improving patient safety and independence.

7. Objectives of the project:

This project aims to create a smart healthcare wearable that uses AI for real-time fall detection. It focuses on improving the safety and well-being of elderly and vulnerable people. By combining AI algorithms with wearable sensors, the device can distinguish between falls and normal activities. It can instantly alert caregivers or medical services. The goal is to provide a reliable, affordable, and portable solution. This will help reduce health risks from delayed medical responses and support SDG 3: Good Health and Well-Being.

8. Methodology:

The project methodology starts with a detailed analysis of requirements and a literature review to identify the weaknesses of current fall detection systems. The hardware design phase integrates an ESP32 microcontroller with an accelerometer and gyroscope (MPU6050) to detect body movements. It also includes a GSM module for automatic calling and SMS alerts. A rechargeable battery and charging module ensure the device is portable. On the software side, the ESP32 continuously processes sensor readings. An AI-based algorithm helps differentiate between normal activities and actual fall events, which reduces false alarms. To boost innovation, a lightweight machine learning model is included on the device for real-time processing. The GSM module is set up to automatically call a pre-registered caregiver if a fall is confirmed. Cloud integration is also part of the system for storing event logs and generating healthcare insights. The system undergoes testing through various simulated fall scenarios to ensure accuracy, speed, and reliability. Finally, the device is housed in a compact wearable case, and thorough documentation is prepared for deployment and practical use.

9. Workplan:

S.no	PHASE	DURATION (10 Months)
1	Research & Requirement Analysis	Month1-2
2	Hardware Design &Prototyping	Month3-4
3	AI Model Training & Integration	Month5-6
4	Software Development & Alerts	Month7-8
5	Testing, Deployment & Report	Month9-10

10. Expected Outcome of the project:

The project is expected to result in an AI-powered smart healthcare wearable that can accurately detect falls in real time and immediately send alerts to caregivers or medical services. This will help reduce the risk of delayed treatment, enhance the safety and independence of elderly and vulnerable individuals, and provide a portable, cost-effective, and energy-efficient solution for continuous health monitoring. Overall, the outcome will contribute to improving quality of life and support the goals of SDG 3: Good Health and Well-Being.

11. **Is the project proposed relevant to the Industry / Society?**

This project is highly relevant to the healthcare industry and society, as it addresses the growing need for elderly care and patient safety. By enabling real-time fall detection and immediate alerts through AI-powered wearables, it helps reduce health risks, prevent severe injuries, and support independent living for vulnerable individuals. This directly benefits hospitals, caregivers, and families, while also contributing to SDG 3 (Good Health and Well-Being) by improving healthcare access and safety.

12. **Can the product or process developed in the project be taken up for filing a Patent?**

Yes / No:

Prior Art search done?

Yes/No:

Note: If your answer is "Yes", you may contact Patent Information Centre of TNSCST. For more details, email: **ms.tanscst@nic.in**

2. **Budget details (The following is a tentative budget with break-up details; it is subject to change depending on the specific project requirements):**

Budget	Amount
a) Materials (Please specify)	
b) Consumables (Please specify)	
c) Miscellaneous (Please specify)	
Total	

3. **Has a similar project been carried out in your college / elsewhere? If so furnish details of the previous project and highlight the novelty & improvements suggested in the present one:**

4. **Any other details (Please specify):**

5. **SPS Coordinator (Identified by the college):**

Note: To be identified by the Head of the Institution. The project proposals must be submitted to TNSCST through SPS coordinator designated.

	Name: Prof. / Dr. / Mr. / Mrs. **Designation/Department:** **Email id:** **Contact No.:**

Note: Any mismatch between the scanned PDF, the details filled in the Google Form, and the hard copy as well as multiple submissions via the Google Form will lead to **disqualification** of the proposal.

Name & Signature of the Project Guide	**Name & Signature of the HOD**	**Name & Signature of the Principal / Head of the Institution (with seal)**

DECLARATION

(From Project Students)

We, the project team hereby declare that the information provided in the enclosed project proposal (Title of the Project:"**Smart Healthcare Wearable for Real-Time Fall Detection"**, Branch: BE.CSE, College: IFET College Of Engineering, Gangarampalayam, Villupuram) are true and correct to the best of our knowledge and belief. We understand that the Tamil Nadu State Council for Science and Technology (TNSCST) will not entertain any changes to the project title or the names of the team members under any circumstances.

We further declare that the proposed project work is original, not copied or purchased from any source. We are committed to carrying out the project independently, with appropriate guidance from our faculty and project guide, and by utilizing the facilities provided by our institution. We pledge to maintain academic integrity, avoid plagiarism, and work sincerely and diligently to execute and complete the project as proposed.

We understand that any false, incorrect, or misleading information provided in this proposal may lead to disqualification or other consequences as deemed appropriate. We also authorize the sharing of the project details contained in this proposal with TNSCST, Chennai.

We acknowledge that, if selected, our team is required to exhibit and present the project at the **Annual State-Level Seminar-cum-Exhibition** organized by TNSCST.

The endorsement form for TNSCST, Chennai is enclosed herewith.

Name of the students with Register No. **Signature with date**

1.SAI THRISHIKA.G(421122102127)

2.KIRUTHIGA.A(421122102079)

Name & Signature of project Guide **Name & Signature of HOD (with Seal)**

ENDORSEMENT

(From College, endorsement to be taken in the Institution / Department Letter head)

This is to certify that the following students:

1.Ms. KIRUTHIGA. A(421122102079)

2.Ms.SAI THRISHIKA.G(421122102127)

are Bonafide final year students of the Department of Computer Science and Engineering, enrolled in the _____ degree program at our institution and it is certified that 2 copies of Utilization Certificate (UC) and final report along with seminar paper will be sent to the Council after completion of the project within specified timeline.

We hereby confirm that, if the project proposal submitted by the above-mentioned students under the **Student Project Scheme** is selected by **TNSCST**, our institution will extend full support by providing the necessary laboratory, computer, and infrastructure facilities required for the successful execution of the project.

Furthermore, we assure that appropriate measures will be taken to ensure the project team participates in the **Annual State-Level Seminar-cum-Exhibition** (if selected) and exhibits/demonstrates their project.

If the student team or project guide fails to submit the completed project report and the Utilisation Certificate within the timeline specified by TNSCST (if selected), our institution will ensure that the sanctioned project amount is returned to TNSCST.

Name & Signature of Project Guide	**Name & Signature of HOD (with Seal)**	**Name & Signature of the Principal / Head of the Institution (with Seal)**