

SPECIMEN FORMAT FOR THESES OF MONTH

Faculty : **Home Science**

Department : **Textiles and Clothing**

Branch/ Area: : **Textiles and Clothing**

Sub Subject Heading: :

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Title of the thesis : **Design, Develop and Evaluate the Smart Wearable
Electronic Fabric for Monitoring Healthcare**

(i) In Roman Script -

(ii) In roman Script

Nomenclature of Degree: :

Month & Year of Enrolment: : **June 2011**

Month & Year of Registration: : **June 2011**

Month &Year of Submission: : **July 2018**

Month &Year of Award : **January 2019**

Name of Supervisor : **Dr. S. Amsamani**

Designation of Supervisor : **Professor, Department of Textiles and Clothing**

**Centre/department/school in
which research was conducted** : **Department of Textiles and Clothing**

University's Name & Address : Avinashilingam Institute for Home Science and Higher Education, Coimbatore- 641043

Abstract within 300 words:

The world is becoming more and more "health conscious" and the need for the improvement of the quality of the health care in medicine is necessary. Textile is playing a great role in the development of monitoring systems for health care safety. In electro-textiles, new techniques such as using conductive yarns have been developed to provide an innovative soft textile interfaces that are highly acceptable to the end user in this present world. Conductive yarns play a vital role in the production of these types of textiles and garments. They enable the collection, storage and transformation of signals received from on source, may be human body, animals or any object and convert it into digital forms which could be noted for further action. Any metallic substance which is capable of transforming electrical charges could be used as conductive yarns. Considering these aspects, designing a smart wearable garments with conductive yarns for transforming electrical charges has been taken up as a research work. At the very outset the current scenario of smart textiles and its awareness was identified through a questionnaire were given to the young mothers with infants when they came to the clinics/hospitals with their wards for regular check up. Aluminum, copper and silver yarns were twisted separately with cotton yarn to form respective conductive yarns. These yarns were further used as weft yarns and woven in respective fabrics with variations in the width of the cotton and conductive yarns. Knitting was also carried out using the conductive yarns. The physical properties of the yarns and conductive fabrics were evaluated and analyzed statically. In order to study the possibility of the transforming these fabrics into smart wearable garments they were connected to commercially available LM35 body temperature sensor and pulse rate sensor were selected to monitor the vital signs. A block diagram of electronic module was designed for data processing and wireless transmission of the processed data. Then the module was prepared with Arduino Uno microcontroller by coding the necessary program for health care monitoring of vital signs. Bluetooth HC-05 module for wireless communication and lithium ion battery for power supply were selected for the study. Smart phone, the convenient medium for data receiving was selected to display the vital signs to parents and pediatrician.

The efficiency of smart wearable electronic band was proved to be effective by rat wear study.

Major objectives :

- ❖ To identify the current scenario of smart textiles and its awareness.
- ❖ To weave fabrics with different conductive yarns and combinations.
- ❖ To prepare knitted fabrics with selected conductive yarns.
- ❖ To evaluate the physical, mechanical, absorbency and conductive properties by standard test methods,
- ❖ To embed appropriate sensor on the above mention fabrics to develop smart wearable electronic fabrics and
- ❖ To evaluate the efficiency of the prepared smart wearable electronic fabrics.

Examiners

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