

Project Topic

From Fiber to Fabric: A Hands-On Textile Journey

Textile Background:

Textiles are among humanity's most versatile technologies, forming an essential part of daily life and industrial development. From clothing and home furnishings to advanced materials used in aerospace, healthcare, defense, and environmental protection, textiles influence nearly every sector of society. Their unique combination of flexibility, strength, and customizability allows them to meet both functional and aesthetic needs, making them a cornerstone of economic, cultural, and technological progress.



Project Description:

This research program is designed to introduce high school students to the fundamentals of textile science and engineering. Over 4 weeks, students will explore the complete journey of turning raw fiber materials into textile products. They will spin their own yarn and use it to create both knitted and woven fabrics. Through this start-to-finish process, students will explore the fundamentals of textile processing, while developing practical skills in spinning, knitting, and weaving.

Prerequisites:

This research project is for high school level students at the 10th grade and above who have an interest in majoring in textile engineering or related field.

Project Outcomes:

By the end of the program, students will be able to:

1. Explain the fundamental stages of textile production, from raw fiber to finished product.
2. Demonstrate yarn spinning, knitting, and weaving skills using hand-operated tools.
3. Evaluate the quality and structure of handmade textile products.
4. Enhance oral communication skills through presentation of their research findings

Program Schedule:

Week 1 Introduction to Textiles & Fiber Preparation

- Overview of textiles: history, significance, and applications.
- Introduction to natural and synthetic fibers; identifying and comparing fiber properties

Week 2 Yarn Spinning

- Principles of yarn structure and twist.
- Demonstration of hand spinning methods.
- Hands-on: spinning raw fiber into continuous yarn.
- Introduction to basic yarn evaluation.

Week 3 Fabric Construction (Knitting & Weaving)

- Introduction to knitting and weaving as textile construction methods.
- Demonstration of hand knitting and weaving methods.
- Hands-on: Knitting & Weaving
- Introduction to basic fabric evaluation.

Week 4 Project Development & Presentation

- Finalizing the hand-made fabrics
- Presentation of projects and peer review
- Feedback and refinement of final deliverables.

Deliverables

- Presentation: A PowerPoint presentation summarizing the research project and sharing the story.

Materials

Students will need some materials for the project, with the total cost kept around \$50. A detailed list will be provided after registration.

Class time

Monday and Friday 8-9 pm.