



Laboratory Brief Overview

University/Institute: NED University of Engineering and Technology

Department: Metallurgical Engineering

Lab Name: Thin Film Lab

Lab In-Charge: Dr.-Ing. Iftikhar Ahmed Channa

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Lab Overview

The Thin Film Laboratory is dedicated to advancing research and innovation in the development of functional thin films for diverse applications, with a vision to become a leading hub of excellence in sustainable materials and device fabrication. Our mission is to provide state-of-the-art facilities and a collaborative environment that support high-quality research, training, and technology transfer in the field of thin film science. The laboratory is well-equipped with modern instrumentation including a UV-Vis spectrophotometer for optical characterization, a Fourier Transform Infrared (FTIR) spectrometer for chemical analysis, blade and roll coaters for uniform film deposition, as well as fume hoods, Oxygen transmission rate (OTR), water vapor transmission rate (WVTR) and clean workspaces that ensure safe and contamination-free processing. Together, these resources enable fundamental studies and applied research to address scientific and industrial challenges.

Equipment List

Equipment Name	Key Specifications	Research / Teaching Applications
FTIR Spectrometer	Range 4000–400 cm^{-1}	Material characterization, polymer analysis
WVTR	Can measure moisture permeation as low as 0.1 $\text{g/m}^2.\text{day}$	Moisture permeation rate
OTR	Can measure oxygen permeation as low as 0.01 $\text{cm}^3/\text{m}^2.\text{day}.\text{bar}$	Oxygen permeation rate

Research Applications / Areas

- Renewable energy material testing
- Advanced manufacturing techniques
- Biodegradable packaging films
- Antibacterial coatings
- Solar cell coatings
- Intelligent sensors for packaging

Ongoing or Notable Projects

Project 1. Title: Synthesis of edible and biodegradable inks for printing on biodegradable films

Project 2. Use of promethazine and linagliptin for solar cell application

Project 3. Improving mechanical strength of biodegradable packaging films by the application of glass flakes

Project 4. Improving mechanical strength of biodegradable packaging films by the application of glass flakes

Project 5. Designing of superhydrophobic and anti-dust coatings for the solar cell applications

Project 6.