

# FACULTY OF MATERIALS AND ENVIRONMENTAL SCIENCES



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*The one of the oldest and best equipped Faculties on the University.*

The Faculty offers several courses leading to Bachelor and Master of Science.

The Faculty consists of two Institutes:

1. INSTITUTE OF TEXTILE ENGINEERING AND POLYMER MATERIALS
2. INSTITUTE OF ENGINEERING AND ENVIRONMENTAL PROTECTION

## **1. INSTITUTE OF TEXTILE ENGINEERING AND POLYMER MATERIALS**

*Head of the Institute:*

*dr hab. Jarosław Janicki prof. ATH*

Departments of:

- Polymer Materials
- Physics and Structural Research
- Textile Engineering and Commodity
- Chemical Technology of Fibers
- Applied Informatics



## 2. INSTITUTE OF ENGINEERING AND ENVIRONMENTAL PROTECTION

*Head of the Institute:*

*dr hab. Henryk Klama, prof. ATH*

Departments of:

- Biology and Environmental Chemistry
- Hydrology and Water Engineering
- Ecology and Nature Conservation
- Sustainable Development
- Processes and Environmental Technology
- Air Pollution Control



### **Textile Engineering area:**

- biomedical textiles,
- polymer bio- and nanotechnologies,
- chemical technology of fiber with impact on biotechnologies in textiles,
- fashion and clothing, with fashion design and CAD/CAM designing, clothing technology and management of clothing industry,
- customs and commodity sciences of textile goods, management and marketing of textiles.

### **Engineering and Environmental Protection area:**

- applied ecology,
- water protection and management,
- information sciences in environmental protection,
- environmental equipment and materials,
- urban engineering and solid waste management,
- bioindication and environmental monitoring,
- sustainable development and biosphere protection.



## FUNDAMENTAL STUDIES

Laboratories of:

- X-Ray diffraction
- FTIR and Raman Spectroscopy
- Scanning Electron Microscopy
- Thermal analysis
- Gas Chromatography
- ICP- MS Spectrometry

## TECHNOLOGICAL STUDIES

Laboratories of:

- Microbiology
- Textile processing
- Textile testing
- Textile chemistry
- Apparel design with computer-aided-design systems

## SCIENTIFIC ACTIVITY

- "BIOCELSOL" Biotechnological Process for Manufacturing Cellulosic Products with Added Value EUROPEAN COMMISSION 6th Framework Program on Research, Development and Demonstration.
- Spinnable molecular nanocomposites form PP, PA6, HDPE and oligomer liquid crystals, for special applications
- Coating of man - made fibers with conductive polymers
- Paper electronics – conductive cellulose
- Alginate fibers for medical applications
- Anti- flammable modification of PP fibers
- Electrospinning of porous fibers from cellulose derivatives
- Artificial Intelligence methods for estimation of crystallinity in semicrystalline polymers.
  
- Structure and properties of bacterial cellulose
- Structure and properties of novel bioactive fibers on the basis of chitin and its derivatives
- Cellulose hydrophobization for hygienic products
- Microbiological and structural analysis of natural polymers including cellulose pulps for hygienic applications
- Biomedical Alginate fibers – structure and properties
  
- Application of conducting polymers in nanofibres

- E-paper based on cellulose and conducting polymers
- Microcapillary polypropylene fibres for special applications
- Biodegradable nonwovens for medical, agricultural and technical purposes
- Biotechnological process for manufacturing cellulosic products with added value
  
- Application of novel membrane systems to wastewater treatment
- Monitoring of ecosystems in Beskidy Mountains region
- Novel systems of dust removal
- Biofiltration of gases from food industry
- Flood protection systems and technologies in Beskidy Mountains region

## **COOPERATION**

Key partners in scientific projects:

- Institute of Biopolymers Chemical Fibers, Łódź, Poland
- Tampere University of Technology, Finland
- Slovak Technical University of Bratislava, Slovak Republic
- Catholic University of Leuven, Belgium

Partners in students internships:

- Turku Polytechnic, Finland,
- Tampere University of Technology, Finland
- Helsinki Polytechnic, Finland
- Technical University of Catalonia, Spain
- Torino Polytechnic, Italy
- University of Gaziantep, Turkey