NATIONAL UNIVERSITY OF ENGINEERING
COLLEGE OF CHEMICAL AND TEXTILE ENGINEERING
TEXTILE ENGINEERING PROGRAM

PIT40 – LABORATORY OF TEXTILE CHEMICAL PROCESSING I

I. GENERAL INFORMATION

CODE	**:**	PIT40 Laboratory of Textile Chemical Processing I
SEMESTER	**:**	8
CREDITS	**:**	1
HOURS PER WEEK	**:**	3 (Laboratory)
PREREQUISITES	**:**	PIT11 Textile Fiber Sciences
CONDITION	**:**	Compulsory

II. COURSE DESCRIPTION

This is course is complementary to theory course PIT39 Textile Chemical Processing I. Students develop skills for the washing degumming, scruffy and bleaching natural and synthetic fiber and fabric. Students experimentally analyze chemical processes and chemical reactants. In this laboratory course, students experimentally verify the theoretical concepts and methods presented in course PIT39 Textile Chemical Processing I.

III. COURSE OUTCOMES

At the end of the course, students:

1. Apply degumming processes and analyze their parameters and results.
2. Apply scruffy processes and analyze their parameters and results.
3. Apply optical bleaching processes and analyze their parameters and results.
4. Apply cotton bleaching processes based on sodium hypochlorite, sodium chlorite
5. and hydrogen peroxide, and analyze their parameters and results.
6. Apply bleaching process to wool and synthetic fibers and analyze their parameters and results.

IV. COURSE CONTENTS

1. Degumming

Gum types / Degumming types / Parameter evaluation: temperature, pH, concentration, time / Iodine index method / Weight loss method.

2. Scruffy

Parameter evaluation: temperature, concentration, time / Evaluation by humectation method / Fabric strength evaluation.

3. Optical Bleaching

Natural and synthetic fiber bleaching / Parameter evaluation: concentration, pH, temperature.

4. Bleaching with Sodium Hypochlorite

Sodium hypochlorite titration / Titration reactions / Bleacher titration / Calculation of bleacher concentration / Evaluation of concentration, alkalinity, temperature / Cotton bleaching.

5. **Bleaching with Sodium Chlorite**
Sodium chlorite titration / Titration reactions / Calculation of bleacher concentration / Cotton bleaching with sodium chlorite / Synthetic fiber bleaching (polyester, acrylic, nylon) / Evaluation of concentration, alkalinity and temperature.

6. **Bleaching with Hydrogen Peroxide**
Hydrogen peroxide titration / Titration reactions / Bleaching oxygen concentration / Cotton bleaching with hydrogen peroxide / Evaluation of bleaching parameters: concentration, temperature, pH.

7. **Wool Bleaching**
Chemical bleaching with hydrogen peroxide / Chemical bleaching with sodium hydrosulfite / Optical bleaching / Evaluation of bleaching parameters: concentration, temperature, pH.

VI. METHODOLOGY

There is a guide for every laboratory experience students should read before the experience. At the beginning of the experience, an entrance test is taken to verify the preparedness of students. Students carry out the experience working by teams and following guide indications and faculty advice. At the end of the experience, students submit a report summarizing main results, analysis and conclusions. Student active participation is promoted.

VII. GRADING SYSTEM

The Final Grade (FG) is calculated with the following formula:

FG = (6 PP + 1 C1 + 2 C2) / 9

PP: Average grade of five laboratory experience work and report
C1: Average grade of entrance quizzes C2: Average grade of final quizzes

VIII. BIBLIOGRAPHY

1. TEXTILE CHEMICAL PROCESSING Laboratory Guide
National University of Engineering, Lima, Peru, 2010
2. **CEGARRA Jose**
Introduction to Textile Bleaching