



Faculty of Engineering and Information Technology
Department of Chemical Engineering

Course Information

Course Name: Chemical Technology Lab. I (10626478)

Total Credits: 1 **Contact Credits: 3 Lab hours per week.**

Course Type: Compulsory **Categorization of Credits: Engineering Topics**

Prerequisites P1: Chemical Reaction Engineering (10626320)

Semester/Year Fall 2023-2024

Course Schedule Tuesday 2:00-5:00 PM

Class Room 111140, 11B1180

Instructor Information:

Instructor Name: **Majd Shhadi**

Contact Information majdshhadi@najah.edu

Office Number Room # 1220 Engineering Building (11)

Course Description

This course aims to introduce the students into the practical aspects they studied in the courses of chemical reaction engineering and material properties and corrosion. This includes the characteristics of the most common chemical reactors such as CSTR, plug flow and batch reactors and the experimental measurements of the conversion in these different reactors. The students will also experimentally study the effect of impeller type, position and speed on mixing process of viscous and non-viscous fluids. In addition, the students will study materials and failure identifications, mechanical properties, microstructure and the preparation of metallic and polymeric samples, different methods of heat treatment, surface hardening for ferrous and non-ferrous alloys and how to determine the corrosion rate of some metals.

Course Learning Outcomes (CLO's)

By the end of this course, students will be able to:

Course Learning Outcomes (CLO's)		Student Outcomes (SO's)	Performance Indicators (PI's)	Contribution %
i.	Develop and conduct good lab practice and operate instrumentation safely and properly	6	6.1	30
ii.	Analyze and interpret collected data and use engineering judgment and appropriate tools to draw conclusions.	6	6.2	25
iii.	Submit well-written technical reports that are factually correct and supported with evidence.	3	3.1	20
iv.	Recognize participant roles in a team setting and fulfil team duties.	5	5.1	10
v.	Communicate effectively among teammates.	5	5.2	10
vi.	Meet deadlines and project goals.	5	5.3	5

Textbook and/ or References

Textbook and/ or References

Textbook: The up-to-date laboratory manual revised by the course instructor and the teaching assistant.

Department of Chemical Engineering. (2013). Chemical Technology (I) Laboratory Manual. Nablus, An-Najah National University

References:

1. Fogler, H. S. (2006). *Elements of Chemical Reaction Engineering*. 4th edition. Upper Saddle River, NJ:Pearson Education Inc.
2. Callister, W. D., (2007). *Materials Science and Engineering*. 7th edition. Wiley.

Assessment Scheme:

Assessment Criteria	Percent (%)
Laboratory Work (Performance)	20
Reports	50
Final Exam	30

Course Plan:	
Week (#)	Topics
1.	Safety Regulations and Requirements in Chemical Technology Lab
	Part One (Reaction Lab)
2.	Homogeneous Batch Reactor
3.	Batch Reactor, Adiabatic Reaction, Isothermal Reaction
4.	Effect of solution viscosity on mixing behavior in stirred tank reactors
5.	Mixing degree Measurements using spectrophotometer.
6.	UV-Vis Spectrophotometer
7.	Synthesis of Carbon Nanodots (CNDs)
8.	Photodegradation of Methylene Blue Dye by Carbon Nanodots
9.	Neutralization of Aqueous Solution of Acetic Acid
	Part Two (Material and Corrosion Lab)
10.	Metal Preparation and Microscopic Examination
11.	Mechanical Properties Tests: Tensile, Hardness and Impact Tests
12.	Heat Treatment of Ferrous Alloys: Quenching, Annealing and Normalizing
13.	Heat Treatment of Non-Ferrous Alloys: Age Hardening
14.	Corrosion Test of Different Alloys vs. Different Chemicals
15.	FINAL EXAM