
Universidad de Ingeniería y Tecnología
School of Chemical Engineering

Course Syllabus - Term 2017-I

1. **Course code and name:** QI0028 – Experimental Chemistry
2. **Credits:** 1 (one)
3. **Hours per session (Lecture and laboratory):** 4 – lab (biweekly)
Total number of sessions: 7 –Labs
4. **Name, e-mail and faculty office hours:**

Coordinator:

Alejandra Ratti

Office hours: by appointment only.

aratti@utec.edu.pe

Course Instructors:

- Melissa Barrera mbarrera@utec.edu.pe
- Lucia Bertholdo lbertholdo@utec.edu.pe
- Max Carlos mcarloss@utec.edu.pe
- María de Fátima Fernández mfernandez@utec.edu.pe
- Rocío Hoyos rhoyos@utec.edu.pe
- Ángela Pinedo apinedo@utec.edu.pe
- Carmen Zegarra czegarrau@utec.edu.pe

Office hours: to be announced

5. Textbooks:

- S. E. Delgado Ortiz, L. N. Solis Trinta, Y. Muñoz Solá. *Laboratorio de Química General*, México D.F.: McGraw-Hill, 2012.
- T. L. Brown, H. E. LeMay, B. E. Bursten, C. J. Murphy, P. M. Woodward, A. E. García Hernández, *Química: la ciencia central*, 12ma ed, México D.F.: Pearson Educación, 2014
- R. Chang, K. A. Goldsby, O. S. Sarmiento, E. J. H. D'Orneville, *Química*, 11ma ed, México D.F.: McGraw-Hill, 2013
- R. Petrucci, G. Herring, J. Madura, C. Bissonnette, *Química General*, 10ma ed, México D.F.: Pearson Educación, 2011

Supplemental material:

- M. S. Silberberg, *Química General*, 2da ed, México D.F.: McGraw-Hill Interamericana, 2002
- L. S. Brown, T. A. Holme, *Chemistry for Engineering Students*, 2da ed, California: Brooks/Cole Cengage Learning,

6. Course information

a. Brief description of course' content (catalog description):

This course is divided into lectures and laboratory sessions, which implies a general introduction to the understanding and application of laboratory safety rules and good laboratory practices; it also includes the study of the fundamental principles of laboratory chemistry throughout experimentation and practical problem solving skills. At the end of the term, engineering students will acquire knowledge on the fundamentals of chemical principles, and recognize the role of the Chemistry in many areas of engineering and technology with focus on finding solutions to a variety of modern problems. Topics covered include: Safety security rules, good laboratory practices, chemical reactions and stoichiometry, gases, acids and bases, and electrochemistry.

b. Prerequisites or co-requisites: None

c. This course is mandatory for all Engineering majors

7. Specific goals for the course:

a. At the end of this course, students should be able to::

- a2: apply Science knowledge (level 1)
- b1: design and carry on lab experiments (level 1)
- d1: work in groups (level 1)
- g2: communicate orally (level 1)
- g3: communicate in a written manner (level 1)
- i3: recognize the need for lifelong learning (level 1)

b. Specific outcomes of the course

1. Apply good laboratory practices
2. Summarize the principal physical and chemical properties of matter
3. Analyze data following accurate measurement and correct interpretation of measurement units.
4. Use of spread sheets to calculate and solve laboratory problems.
5. Apply problem solving skills for: chemical reactions, stoichiometry, solutions and solubility, acids and bases and electrochemistry.
6. Write down laboratory reports with clear language and interpretation of results. The report must contain the following sections: Objectives, procedure, results, discussion of results and conclusions.

8. Brief list of topics to be covered during the course

1. Safety security rules
2. Good laboratory practices

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3. Laboratory material
 4. Measurement: International System of Units, units' conversion and significant figures.
 5. Density.
 6. Chemical bonding and stoichiometry
 7. Gases
 8. Acids and bases
 9. Electrochemistry and electrochemical cells.

9. Methodology and evaluation system

Laboratory sessions:

Laboratory sessions will develop in the Chemistry laboratories and will be biweekly. Laboratory experiences will be developed in groups of 2 or 4 students (maximum). All laboratory sessions will be evaluated according to: 1) Group performance in good laboratory practices, 2) oral or written evaluation of the understanding of the laboratory practice of the day, and 3) written report: detailed written report summarizing main ideas, observations and discussions as a result of the development of the laboratory practice.

Evaluation System:

Laboratory final grade is the average of the 7 (seven) reports turned in to your instructor. None of the laboratory reports is dropped.

Final grade= $L1+L2+L3+L4+L5+L6+L7=100\%= 11$ (eleven) points.

L= laboratory

Each laboratory session will include 3 parts of evaluation: attitudinal (individual), pre-lab assessment and report (in group).