Code: **QF634**

Name: **Físico-Química Experimental I**

Name in English: **Physical Chemistry Laboratory I**

Name in Spanish: **Físicoquímica Experimental I**

Subject type: **Weekly**

Approval Type: **Grade and Attendance**

Characteristic: **Regular**

Frequency: **75%**

Period Type / Offering period: **Semester / 2nd Period - even periods**

Requires Final Exam: **Yes**

Vectors

T	L	P	O	PE	OE	SL	WEEKS	CREDITS
-	**4**	**-**	**1**	**-**	**-**	**4**	**15**	**5**

Occurrence on curriculum: **05**

Pre requirement: **QF531**

Summary: **Experiments related to the following topics: chemical thermodynamics, kinetics, electrochemistry, phase equilibrium, and colligative properties.**

Program:

The experiments selected for this course aim to reinforce fundamental concepts of Physical Chemistry, complementing the content of theoretical courses in the curriculum and introducing students to new methods, techniques, and equipment. It is expected that students develop and expand their understanding of phenomena, application of the scientific method, and presentation and analysis of experimental results.

LIST OF TOPICS AND EXPERIMENTS

TOPIC 1. Chemical Kinetics and Ionic Mobility

1- Kinetics of methylene blue reduction

2- Sucrose inversion kinetics

3- Oscillating reaction

TOPIC 2. Phase Equilibrium

1- Liquid-vapor equilibrium

2- Liquid-liquid equilibrium

3- Phase equilibrium in ternary systems

4- Solid-solid phase equilibrium

5- Phase equilibrium (experiment in pilot plant)

TOPIC 3. Thermodynamics

1- Excess molar volume

2- Heat capacity of materials

3- Solution enthalpies

TOPIC 4. Chemical Equilibrium and Potential

1- Reaction equilibrium

2- Ebulliometry

3- Cryoscopy

4- Electrochemistry

Basic Bibliography

1) ATKINS, P.; DE PAULA, J. **Físico-Química**. 9º ou 10° Edições. LTC - Livros Técnicos e Científicos Editora LTDA. Volumes 1 e 2.
2) LEVINE, I. N. **Physical Chemistry.** 6 Edição. McGraw-Hill, Inc. 2008. Volume 1.

3) LEVINE, I. N. **Físico Química**. 6º Edição. LTC - Livros Técnicos e Científicos Editora LTDA. 2012. Volumes 1 e 2.

Supplementary Bibliography

1) SHOEMAKER, D. P.; GARLAND, C.W.; NIBLER, J.W. **Experiments in Physical Chemistry.** 5th Edition. McGraw-Hill,Inc. 1989. Volume 1.
2) FINDLAY, A. **Practical Physical Chemistry.** 8th Edition. Longmans, Green and Co. Ltd. 1967. Volume 1.
3) DANIELS, F.; ALBERTY, R.; WILLIANS, J.W.; CORNWELL, C. D. **Experimental Physical Chemistry.** 7thEdition. McGraw-Hill,Inc. 1970. Volume 1.
4) CROCKFORD, H.D.; NOWELL, J.W.; BAIRD, F.W.G. **Laboratory Manual of Physical Chemistry.** 2thEdition. John Wiley & Sons, Inc. 1975. Volume 1.
5) In addition to the bibliographies covering the Fundamentals of the Subjects, the Faculty will supplement it with specific bibliography for the conduct of the experiments.