

Laboratory IV

Calendar: 4th semester

Contact Hours: 45h00 PL + 15h OT

Scientific Area: Processos em Engenharia Química e Biológica

Learning outcomes of the curricular unit

The curricular unit of Laboratory IV consists of a set of laboratory work involving the application of knowledge to be acquired in UCs of Separation Processes I, Transport Phenomena II, Industrial Electrochemistry and Corrosion, Chemical Reactors and Materials. It is intended that in this UC, the student acquires the following expertise: Plan, execute, develop and optimize experiments in the area of the curricular units that the laboratory work concerns. Interpret results of experiments that highlight some of the fundamental concepts of the above mentioned curricular units; correlate theoretical models with their correct applicability in the treatment of the experimental results. Manipulate materials/ specific equipment used in the proposed experiments. Assess the importance of the accuracy of the performed measurements. Prepare clear and objective scientific reports.

Syllabus

Chapter 1 (2 weeks):

Experiments associated with the curricular unit of Chemical Reactors

Chapter 2 (2 weeks) : experiments associated with the curricular unit of Industrial Electrochemistry and Corrosion

Chapter 3 (2 weeks) : experiments associated with the curricular unit of Transport Phenomena II

Chapter 4 (2 weeks) : experiments associated with the curricular unit of Separation Processes II

Chapter 5 (2 weeks) : Works associated with the curricular unit Materials

Demonstration of the syllabus coherence with the curricular unit's objectives

Laboratory IV is a curricular unit that aims to consolidate the theoretical and theoretical-practical knowledge acquired in the various curricular units lectured in the same semester (Materials, Industrial Electrochemistry and Corrosion, Transport Phenomena II, Separation Processes I and Chemical Reactors). By performing these laboratory experiments, students will gain knowledge of planning, implementation, development and optimization of experiments, in the area of the curricular units that the laboratory work supports, as well as learn to correlate the experimental work with the theoretical models taught, its correct applicability in the treatment of the experimental results. Syllabus was defined to directly follow the curricular unit's objectives.

Teaching methodologies (including evaluation):

The completion of each practical work is preceded by performing a quiz related with the protocol of each laboratory practical work. Before each laboratory class, students should make the preparation of the work by: making annotations of the theoretical principles, experimental procedure, safety care in the execution of the experiment and perform calculations on the individual lab notebook, which is mandatory to bring to classes. Student performance during the experimental activity is accounted for the final grade. Students have to submit a report for each experimental work. The reports will be discussed later in a session that accounts for the final grade. Also, one of the experimental classes will be performed with an English written protocol.

Demonstration of the coherence between the teaching methodologies and the learning outcomes.

Laboratory IV is a curricular unit that aims to consolidate the theoretical or theoretical-practical knowledge acquired in the several curricular units of the semester. Several experimental experiments are carried out and results are presented through a written report with evaluation. Questionnaires are made at the beginning of each laboratory class in order to get a better preparation for each experimental work. Student performance in the execution of laboratory work is evaluated as well as the laboratory reports and the laboratory notebook, allowing to get some laboratory experience. The preparation of a report and respective discussion/ presentation allows the teacher to have a better perception of the student understanding concerning the concepts applied in practice.