

## ACTIVITIES OF INDUSTRIAL CHEMISTRY CAREER, TECHNOLOGY FACULTY UNIVERSIDAD MAYOR DE SAN ANDRÉS, ECTN MEMBER

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The Industrial Chemistry Career - Faculty of Technology of the UMSA, as a member of ECTN and in its condition of Accredited Test Site (ATS), for the EChemTest program, presented a work plan that was approved by the VEC of ECTN, to be executed during the last quarter of 2019.

The activities proposed to be carried out in the mentioned period are shown in the following table:

Activity	n
Q1 Number of own sessions planned for UMSA	60 SES
Q7 Number of hours planned for correcting an existing library's question	50 h
Q8 Number of hours planned for dissemination activities of EChemTest®	30 h

Due to the political problems in Bolivia, originated in the election of the country's president, universities have been closed for approximately two months (October to December), which is why the ECTN project has been partially disseminated and no EChemTest program exams have been taken, despite having a group of students prepared for the General Chemistry tests (GC1 and GC2) and the computer room with 20 computers registered by the program administrators.

The Industrial Chemistry Career has suspended the accreditation audit that was to be carried out in April 2020, in which it has been proposed to improve the academic level with the adoption of the SES of the EChemTest program, gradually starting this year.

In Bolivia, as in most countries in the region, all presential academic activities and the execution of educational projects have been suspended, due to the COVID-19 pandemic, from March 13 to the date. To avoid damage to university studies and student desertion, which reaches up to 15% of the initially enrolled population, the university authorities have approved the continuity of academic activities, from May, until the end of the year, completing the second semester II / 20, through the use of platforms for virtual education, such as Moodle, Google Classroom, Zoom, and others.

There have been numerous difficulties in the implementation of the virtual teaching system, in the case of the students, it is possible to mention the lack of internet access, the lack of a computer or cell phone for this work and the ignorance or little experience in the management of these platforms. For their part, teachers with different degrees of experience in managing these platforms have ventured into virtual education, which requires more time than that dedicated to presential education, due to the need to complement the topics with the contents that the technological resources put at our disposal.

In the case of laboratory practices, it is difficult to substitute the contents that are experienced and learned in a laboratory, it is in this field that the greatest efforts should be made, to try to achieve

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through simulations, partial presential classes and other options, the "level of learning by practicing", which is acquired in a laboratory.

Dedicated work is also required to achieve adequate and effective assessment systems, given the conditions in which students sit for exams.

Despite the severe limitations that the pandemic has imposed on the realization of presential activities in education systems, Industrial Chemistry Career, as a member of ECTN and within the framework of the EChemTest program, the following activities have been carried out:

- On March 13, an additional training session was held online, with Prof. Osvaldo Gervasi, on the management of LibreEOL software, to administer the running of EChemTest® Self-Evaluation Sessions (SES).
- The review of General Chemistry GC1 and GC2 libraries has been completed, and the Analytical Chemistry 3 (AC3) and Physicochemical (PC3) libraries are being reviewed. The Organic Chemistry (OC3) and Inorganic Chemistry (IC3) libraries will be requested for the year 2021, for review by teachers in these areas.
- The UMSA has received the invitation of Prof. Smith and has participated on July 3 in the virtual ceremony of the 50th Anniversary of the European Society of Chemistry, EuChemS.
- In July, the invitation to participate in the VEC meetings and a remote training event for managing a TC, running SES, before the ECTN General Assembly, was received from Prof. Laganà, having confirmed the participation of the UMSA in these activities.

To the extent that Bolivia has better control of the pandemic and until the application of a vaccine allows a full return to presential academic activities, we will carry out virtual and partial presential activities that allow us to obtain results to work as a National Test Center (NTC), with the EChemTest program and others from ECTN, in the following professional careers throughout the country: 7 Chemical Engineering, 6 Biochemistry and Pharmacy, 4 Industrial Chemistry and 3 Chemistry, with an estimated population of 5000 students.

It is our interest to coordinate with the VEC all the work that must be done with the team of the Universidad Complutense de Madrid, for the validation of the question and answer libraries of the EChemTest program in Spanish, to promote the SES of chemistry subjects in countries in the region.

We wish to disseminate throughout the Bolivian university system, the activities of ECTN and its various programs, especially the EChemTest program, and contribute to its sustainability with financial income from SES to external institutions and the sale of official SES approval certificates.

As universities that are part of ECTN, we have a great challenge, first, to maintain the quality of chemical training through virtual teaching and then, to improve the professional training of our students in a global way.

## **ECTN 2020 General Assembly**

The pandemic has forced the suspension of the presential General Assembly of the ECTN set for last April, it was held virtually and we have attended the meetings from October 1 to 3.

Since the UMSA has the ECTN membership, this is the first General Assembly in which we have participated fully, with great expectation in the various issues that have been considered through the reports of the ECTN working groups, and have possibly responded to these questions for post-pandemic university activity:

- What is the Role of Universities and Higher Education?
- What alternatives do we have within the so-called Virtual University Education?
- What evaluation systems should be implemented in Virtual Education?
- How to motivate the use of EChemTest tests in all ECTN member universities?
- What is the importance of the EChemTest tests in the academic certification processes?
- What technical support can ECTN give to universities for the virtual teaching and evaluation of theoretical subjects in chemistry and laboratory practices?

Participation in the meetings before the GA and the final session has allowed us to meet in a virtual way the professors Anthony Smith, Antonio Laganà, Emmanuel Sinagra, Sanjiv Prashar, who have facilitated our relationship and integration with ECTN.

Although the virtual meetings have lacked the human warmth of a presential meeting, the friendship and fraternity of a scientific community of chemical professionals, teachers and researchers have been perceived among the participants, who have shared their concerns and contribute to the development of ECTN, working together for a long time.

There are several ECTN projects are successfully developed in working groups, their reports have been explained during the GA, showing the future projection of the institution in various fields of chemistry.

In the universities, chemists workgroups with computer specialists should be formed to improve the classes of chemistry subjects, laboratory practices, and evaluations and define a strategy to have a new system of virtual and presential classes.

It is necessary to contribute to the sustainability of the EChemTest program, through greater participation of ECTN member universities, supporting the continuous improvement of LibreEOL software, updating and increasing the number of questions from libraries, and conducting a greater number of Self Evaluation Sessions (SES).

Currently, the EChemTest and its libraries are still the most valid European standard, its status as the main European standard of chemistry education must be consolidated.

During the EuChemS 50th Anniversary ceremony, the need for joint work by European and world institutions was raised, given the urgency of strengthening the multidisciplinary education of chemical professionals, so that they contribute from all areas of work and the research, in search of solutions to the main challenges facing humanity in health, education, the development of science and technology, the environment, the growing energy, and food requirements, and current social problems.

This exhortation has been the framework for this virtual General Assembly of ECTN, to define its future actions oriented to the training of high-level human resources in the various areas of chemistry.