

## DEBITS/CREDITS OFFSET FOR ECHEMTEST® ACTIVITIES

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ECheMTest® is a project of the Virtual Education Community (VEC) Committee [1] of the European Chemistry Thematic Network (ECTN) [2] providing a service of chemistry competence assessment and certification leveraging two high level software tools: EOL [3] and CHEM-LEARN [4].

EOL, is an e-testing Open Source software designed and developed at the Department of Mathematics and Computer Science of the University of Perugia (IT) [5]. It is a running engine of the Self Evaluation Sessions (SES)s taken under controlled conditions at an accredited Test Center (TC) of ECTN in which the usage of the libraries of Questions and Answers (Q&A) and the feedbacks provided by the test taker are managed, monitored and recorded so as to allow a proper evaluation of his/her competence in Chemistry.

CHEM-LEARN, is instead, a portal offering several user-centric services built on top of EOL allowing to:

1. produce Proficiency Certificates when requested;
2. generate Demo test sessions when requested;
3. record the activities carried out by the ECTN TCs;
4. record the plans for future activities of ECTN TCs;
5. manage credits/debits generated by the ECTN TC activities according to the adopted Prosumer (producer/consumer) model.

Significant progress of CHEM-LEARN has been made recently in order to implement algorithms suited to correlate data produced by EOL to a tentative Quality of a User (QoU) parameter developed for Virtual communities [6,7]. The algorithm adopted converts information on activities performed by the TCs when carrying out EChemTest® activities into debits and credits. To this purpose the following EOL records:

- a) the number of sessions run by a TC;
- b) the number of related errors;
- c) the number of sessions run by a TC on behalf of other institutions (e.g. external ones, another TC, an ECTN member or the ECTN itself);
- d) the number of hours spent for creating or updating, respectively, one or more library's questions;
- e) the numbers of hours spent for dissemination were taken into account. Results obtained for the years 2018 and 2019 are shown in Tables 1 and 2.

| <b>Reports for the year: 2018</b> | <b>Q1. Number of own sessions run (with no errors)</b> | <b>Q2. Number of sessions run on behalf of other ECTN Members</b> | <b>Q3. Number of sessions run on behalf of ECTN</b> | <b>Q4. Number of sessions run on behalf of an external Institution</b> | <b>Q5. Number of sessions run by any other ECTN Member on my behalf</b> | <b>Q6. Number of hours spent for creating a new library's question</b> | <b>Q7. Number of hours spent for correcting an existing library's question</b> | <b>Q8. Number of hours spent for dissemination activities</b> | <b>CREDITS / DEBITS</b> |
|-----------------------------------|--|---|---|--|---|--|--|---|-------------------------|
| NTC.HU                            | 503  | 0   | 96  | 0  | 0   | 0  | 0  | 0   | -1298.50                |
| NTC.AT                            | 546  | 0   | 0   | 0  | 0   | 0  | 0  | 0   | -1561.00                |
| NTC.NL                            | 49   | 0   | 0   | 0  | 0   | 0  | 0  | 2   | 0                       |
| NTC.RU                            | 123  | 0   | 0   | 0  | 0   | 0  | 20   | 0   | -160.00                 |
| NTC.PL                            | 181  | 411   | 0   | 0  | 0   | 0  | 0  | 0   | 74.5                    |
| NTC.SI                            | 10   | 0   | 0   | 0  | 0   | 0  | 5  | 0   | 0                       |
| NTC.GR                            | 48   | 0   | 0   | 0  | 0   | 0  | 0  | 2   | 0                       |
| NTC.SP                            | 0  | 0   | 0   | 0  | 0   | 0  | 25   | 0   | 0                       |
| ATS.PERUGIA.IT                    | 85   | 0   | 0   | 0  | 0   | 0  | 0  | 0   | 0                       |
| ATS.MILANO.IT                     | 549  | 0   | 0   | 0  | 0   | 0  | 0  | 20  | -1501.50                |
| ATS.GENOVA.IT                     | 39   | 0   | 0   | 0  | 0   | 0  | 0  | 0   | 0                       |
| ATS.NAPOLI.IT                     | 0  | 0   | 0   | 0  | 0   | 0  | 0  | 0   | 0                       |

Table 1 – Credits/Debits from EChemTest activities in the year 2018

| <b>Reports for the year: 2019</b> | <b>Q1. Number of own sessions run (with no errors)</b> | <b>Q2. Number of sessions run on behalf of other ECTN Members</b> | <b>Q3. Number of sessions run on behalf of ECTN</b> | <b>Q4. Number of sessions run on behalf of an external Institution</b> | <b>Q5. Number of sessions run by any other ECTN Member on my behalf</b> | <b>Q6. Number of hours spent for creating a new library's question</b> | <b>Q7. Number of hours spent for correcting an existing library's question</b> | <b>Q8. Number of hours spent for dissemination activities</b> | <b>CREDITS / DEBITS</b> |
|-----------------------------------|--|---|---|--|---|--|--|---|-------------------------|
| NTC.HU                            | 401  | 0   | 201   | 0  | 0   | 0  | 0  | 0   | -819.00                 |
| NTC.AT                            | 368  | 0   | 0   | 0  | 0   | 0  | 0  | 0   | -938.00                 |
| NTC.NL                            | 42   | 0   | 0   | 0  | 0   | 0  | 0  | 2   | 0                       |
| NTC.RU                            | 117  | 0   | 0   | 0  | 0   | 5  | 1  | 4   | -135.00                 |
| NTC.PL                            | 246  | 0   | 342   | 0  | 0   | 0  | 0  | 0   | -112.00                 |
| NTC.SI                            | 0  | 0   | 0   | 0  | 0   | 0  | 0  | 0   | 0                       |
| NTC.GR                            | 0  | 0   | 0   | 0  | 0   | 0  | 0  | 0   | 0                       |
| NTC.SP                            | 0  | 0   | 0   | 0  | 0   | 0  | 15   | 10  | 0                       |
| NTC.BL                            | 60   | 0   | 0   | 0  | 0   | 0  | 50   | 30  | 0                       |
| ATS.PERUGIA.IT                    | 56   | 0   | 0   | 0  | 0   | 0  | 0  | 0   | 0                       |
| ATS.MILANO.IT                     | 711  | 0   | 0   | 0  | 0   | 0  | 0  | 0   | -2138.50                |
| ATS.GENOVA.IT                     | 0  | 0   | 0   | 0  | 0   | 0  | 0  | 0   | 0                       |
| ATS.NAPOLI.IT                     | 0  | 0   | 0   | 0  | 0   | 0  | 0  | 0   | 0                       |

Table 2 – Credits/Debits from EChemTest activities in the year 2019

## REFERENCES

- 1] <http://ectn.eu/committees/virtual-education-community/echemtest>
- 2] <http://ectn.eu/>
- 3] <http://echemtest.eol.unipg.it>

4] <http://www.chem-learn.com>

5] <https://echemtest.libreeol.org>

6] A. Laganà, S. Crocchianti, N. Faginas Lago, A. Riganelli, C. Manuali, S. Schanze, From Computer Assisted to Grid Empowered Teaching and Learning Activities in Higher Chemistry Education in Innovative Methods in Teaching and Learning Chemistry in Higher Education, I. Eilks and B. Byers Eds, RSC Publishing (2009) pp. 153-190; ISBN 978-1-84755-958-6

7] C. Manuali, A. Laganà, A Grid Credit System Empowering Virtual Research Communities Sustainability, Lecture Notes Computer Science, 6784, 397-411 (2011)