CENTER FOR QUALITY ASSESSMENT IN HIGHER EDUCATION

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# OVERVIEW REPORT FOR ELECTRICAL ENGINEERING STUDY FIELD

2020 year of the evaluation

**Prepared by the chairpersons of the expert panels:**

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# I. INTRODUCTION

The overview is based on the external quality evaluation of the Electrical Engineering study field in the following Lithuanian Higher Education Institutions (HEIs): at *Kaunas University of Technology; Vilnius Gediminas Technical University (Vilnius Tech); Klaipėda University; Kaunas College; Kaunas Technical College, Klaipėda State College; Panevėžys College, Šiauliai State College, Vilnius technology and Design College .*

The external evaluation (-s) was/were organised by the Lithuanian Centre for Quality Assessment in Higher Education (SKVC).

Comprehensive external evaluation reports including strengths and weaknesses and concluding with recommendations were prepared separately for first and second cycle field studies and included evaluation marks. This overview focuses on the main findings of the external evaluation of the Electrical Engineering study field from a general point of view.

Based on the findings of the evaluation, all studies at all HEIs the were the given positive evaluation.

On the basis of external evaluation report of the study field SKVC takes a decision to accredit study field and cycle either for 7 years or for 3 years. If the field evaluation is negative such study field is not accredited. Number of studies and HEIs accredited for 7 years: 8; number of studies and HEIs accredited for 3 years: 1.

# II. STUDY FIELD OVERVIEW BY EVALUATION AREAS

Overall observations by the expert panel regarding the most positive aspects of the study field in Lithuanian HEIs as well as areas in need of improvement. The analysis covers all 7 evaluation areas.

### 3.1. Intended and achieved learning outcomes and curriculum

Both teams found that the achieved learning outcomes did very well match the expectations, including international standards. The curricula match all the respective legal and professional regulations, credit numbers, the distribution of credits among groups of subjects always corresponded to the frames given. In some HEI's cases it could be mentioned that several more elective subjects could be introduced, in order to diversify the material according to the personal interests of the students. Generally, the learning outcomes are rather well fit to the expectations and suggestions of the professional institutions and the (mainly regional) companies. This is ensured through continuous involvement of these bodies in the curriculum development process. On the other hand, matching the curricula to the direct expectations of the stake holders hides a danger as well: some up-to-date areas which have not yet manifested in the everyday practice of the stake holders may not appear at all, or with too little weight. This handicap may be eliminated by more intensive participation in the international scientific community of the EE field, where the IEEE as the most important scientific and professional society group may be mentioned.

### 3.2. Links between science (art) and studies

As mentioned above, the intensity of the influence of the international research results and scientific achievements should be definitely much higher. Although the teams observed just sufficient (mainly applied) research activities at the HEIs, the scope and nature of these activities should be considerably wider. The dominating research type is based on company collaboration and targets first of all research/development type work with relatively little novelty in the results if it is compared to the international scenario. In some HEIs, there is a focal point; in some cases, there are even several of them where long term and basic research is going on, but usually, these focal points are connected with a small number of outstanding Professors or Doctors, while the majority of the teaching staff is only involved in development or short term research, or not at all. This fact clearly influences the development of the curricula, as it was mentioned in the above section.

At this point some suggestions must be given. The available funding for both directions of the mobility is far from being sufficient. There should be at east an order of magnitude more intensive participation present in really international scientific conferences. Our observation is that most such events attended by the teaching staff of the HEIs, reported by them, are domestic, or domestically organised even if with international participation; in some few cases, conferences in the Baltic countries, in even less cases, in Central and Eastern European countries are mentioned. There is a complete or almost complete lack of participation at the large European conferences and especially, of the overseas world congresses. Such participation has two conditions: available internationally noticeable novel research results and available funding for these, usually rather costly conference participations. Our opinion is that in the very fast developing area of EE, the government should invest considerable more, by making all important digital data bases available for all HEIs, by offering much wider possibilities for inviting visiting professors of the “first league” for even periods of months, which enables real and intensive collaboration between them and the local teaching staff members, and finally, by introducing a system of long term and basic research grants, which include additional salary, funding for equipment and computational hardware and software, and generous covering the costs of real important international conference participations for those who achieve good research results. Let us stress the fact that personal meetings and the exchange of ideas may largely promote research efficiency of the Lithuanian teaching staff.

### 3.3. Student admission and support

We found that the system of student admission is fair at all HEIs. The support of students is typically sufficient, even, in some cases, outstanding. The main problem is the small number of interested prospective students in the EE and very likely, in most engineering fields. This is a very difficult point where only long term economic policy may help, especially, an efficient and attractive salary policy. These questions are, however, definitely beyond the competency of the evaluation teams.

In any case, at some HEIs there is serious difficulty in starting the programme every year (if it is possible at all), and the restricted availability of electives can be also explained by the fact of too few students.

### 3.4. Teaching and learning, student performance and graduate employment

Because of the close collaboration with the stake holders, especially, the EE companies in the regions of the HEIs, the employment statistics are very good. As companies take intensive part in the curriculum development and continuous updating, and they usually offer thesis topics for the students, there is a good feedback coming from those companies. This is very advantageous from the point of view of the level of teaching and learning, and usually, student performance very well matches the expectations.

The problems mentioned in the section about the scientific links apply, however, also here, the students get little opportunity to get acquainted with the most up-to-date scientific directions, which have not yet reached the production companies, and often neither the HEIs.

There is too little international mobility of students, which should be increased by several measures. We suggest the reorganisation of Erasmus trips to part semesters, organising student groups going together, offering language and cultural courses to prepare outgoing students, negotiating with the employers of the students to enable one or several months' leaves from the companies. Offer more courses in English for incoming students.

### 3.5. Teaching staff

The teaching staffs are usually very dedicated and they do excellent jobs within the available frames. However, the problems mentioned in Section 3.2 determine the degrees of freedom for most teachers. If there is no or very little direct communication with top international scientists and professors of the field, it is hard to start internationally noticeable research. If there is no funding available for presenting such research results to the wide international peer community, there is no feedback and no stimulating suggestions coming from those peers. Except a few outstanding staff members, the international mobility is restricted to Erasmus trips, where funding is scarce and the real practice shows much less real professional activities than the reports suggest. While Erasmus is important and useful in itself, it should not be the main means of mobility for staff members. As suggested above, a really generous and efficient funding system, combined with remunerative encouragement of high level (Q1, maybe Q2) journal publications should help on the medium term, as the practice of several countries has shown it.

### 3.6. Learning facilities and resources

We found that the learning facilities are everywhere rather good, or even, excellent, and the resources for teaching are comparable with international standards. This is partly due to the good collaboration with the regional and local companies, and funding obtained from applied research projects. There has been no problem noticed in this respect.

### 3.7. Study quality management and public information

In some cases the teams found that study quality management is very good, even excellent. At some HEIs, the system of quality assurance procedures and relevant documents may be classified as exemplary. Public information is usually ample, the HEIs do whatever is possible

for catching the attention of prospective students; and during the study process, students and external stake holders may access all the necessary information. In these respects, the evaluation teams may express their full satisfaction of the overall situation.

# III. EXAMPLES OF EXCELLENCE

1. Very good facilities and resources available for the teaching and study process.
2. Excellent support to students by individual consultations and individual project supervision.
3. Excellent system of quality assurance and management in some of the HEIs evaluated.
4. Support from the SKVC during the whole process of evaluation. Especially the positive attitude of the coordinator must be pointed out and her helping role in solving of some turbulent and complicated situations should be mentioned as well.

# IV. RECOMMENDATIONS

## MAIN STRATEGIC RECOMMENDATIONS FOR THE IMPROVEMENT IN ELECTRICAL ENGINEERING STUDY FIELD

- **Strategic recommendations for the Higher Education Institutions (at institutional level):**

1. Intensively search for possibilities of more international teaching staff member mobility, both incoming and outgoing.
2. Increase student mobility by all available means, especially by advertising Erasmus semesters and part semesters, with advantageous mutual recognition of credits, and with preparatory language courses offered.
3. In every HEI take a very deep look on the SPs inside of the SF of EE (Electrical Engineering) for initiating the negotiations over set of measures to improve the specialization possibilities in different HEIs with the aim to decrease the parallelism in SPs for SF of EE.

- **Strategic recommendations for the Ministry of Education and Science and Sport (at national level):**

1. Increase essentially the amount of funding for long term and basic research, further, for quality level international mobility.
2. Introduce a system of individual encouragement for high level (Q1, maybe Q2) international journal publications.
3. Increase the interest of prospective students in studying for EE and other engineering degrees by applying an attractive salary policy.

**Additional observations and comments concerning the whole evaluation process**

In 2021 the evaluation was defined as an approach for Study Field (SF). However, the questionary and the template followed in majority the line of evaluation templates of previous years. The information we got during the evaluation process the chain of different levels in the study process can be put as: study course (SC)>study module (SM)>study program (SP)>study field (SF)>HEI>Ministry of Education and Science and Sport. The former evaluations covered very well the first three levels of the chain. In 2021, the next level of evaluation was introduced, which was enough large change in the understanding of the whole process. Referring to Neil Armstrong: it was a small change in the previously indicated chain, but large change in the understanding and policy in the field of higher education generally.

Therefore, the questionnaire was a bit out of focus of the initial standpoint and outdated (evaluation of the SF). If the evaluation focusses on SF, then to go in detailed evaluation of SP is waste of resources because of attempt to evaluate the political decisions, which should be done by the Ministry of Education and Science and Sport and must be taken by the evaluators as *force major*.

If we are talking about the SF, then two boarder situations can be named. Form one side the State policy could define the situation so that the SFs are divided by the State among the HEI's, and they must develop the SPs inside the SF considering the local economical/industrial situation. So, this is the case of minimum degree of freedom (there is no real competition between the HEIs). Another situation is the opposite that all HEIs have the right to cover all SFs with so many SPs as they want and only the limitations are coming from the finances and the availability of student candidates (everybody competes with everybody). Some sort of mid-situation exists in practice in Lithuania. Anyway, in all cases to follow the evaluation of the SFs the questionnaires (template) should not include the detailed questions about the SPs and their outcomes. At the same time to evaluate the political decision which model has been implemented in the country is not the task of evaluators.

The second observation in this evaluation was the random mixing of different institutions of HEI into the same panel. It came clearly to the surface due to the COVID-19 situation when the whole process took place remotely. But this has a wider importance as well. It is understandable that this model was almost excellent in case of real site visits, where the evaluation process longer than a week is almost impossible to plan. In case of remote scenario and modifying the evaluation process so that for example only three important question areas are examined (see next example bellow) will give the possibility to modify the process (decrease the time for one evaluation of the HEI) and separate the different levels HEIs into the same group. Today the universities and colleges were evaluated jointly. It is like the situation, when we want to mix the regular football leagues (premium league and the first division for example) so that the teams play for the championship jointly. The problem is that to evaluate the universities and colleges using the same criteria should be avoided (unfair approach), especially in cases, when the different panels deal with the same SF in different HEIs.

The additional proposal for reforming the evaluation process concerning the most relevant topics characterizing the SFs at the HEI. The process and the template could be look like as follows:

### 3.1. "Teaching staff' life"

Teaching staff quality and the links between science (art) and studies on base of learning outcomes of SF. The graduate employment situation.

**3.2. "Students' life".**
Student admission and support, study quality management and public information. Intended and achieved learning outcomes of the curriculum.

**3.3. Resources.**
Learning facilities and available financial and other resources.

- **Some ideas, which could be added to the strategic recommendations for the Ministry of Education and Science and Sport (at national level):**

1. To start the actions for simplification of the evaluation process in a way that the report of the evaluation team covers less, but more significant fields in the report (see earlier text).
2. Start the discussions for initiating the hybrid scenario of evaluation in the future. For example, the model could be that first remote site visits take place and then after composing the evaluation reports the panel comes together physically for 1, maximum 2 days discussions over the report, which will be then finalised immediately.
3. Evaluation process should be carried on separately for colleges and universities, where for the last institutions also the PhD studies will be involved for the evaluation (see also the earlier text).

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