**Faculty of Environmental and Manufacturing Technology**

technical university in zvolen



**report**

**on scientific and research activities at FEMT TU in zvolen for 2018**

Proposal for a decision:

Scientific Board of FEMT TU in Zvolen

Withthe right for the 2018 FEMT, it approved:

(a) no comments,

(b) with comments

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from the documents of the heads of the FEMT departments in Zvolen

Zvolen 2019

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# INTRODUCTION

We present to the Scientific Council of the Faculty of Environmental and Production Technology the Report on Scientific and Research Activities for 2018.

The purpose of the report is to:

* capture and document the state of play in the field of science and research, as well as in other activities in the 2018 assessment year;
* quantify parameters from the field of science and research and related publishing activity for some procedures for the redistribution of funds at the faculty,
* ensure continuity and comparability of endpoints,
* summarize the documents for the elaboration of materials for the periodic evaluation of the faculty by the authorities of the Ministry of Education of the Slovak Republic and ak,
* to provide the members of the Scientific Council of FEMT with the basis for obtaining a comprehensive overview of the structure of qualitative and quantitative indicators in the field of science and research management at the faculty, so that they can adjust the process of organization and direction of scientific research activity and current dreams by their decision-making, in order to gain an overview of the state of affairs in individual departments.

The report is designed to provide a comprehensive and objective picture of what is happening in the fields of science and research, scientific education, cooperation, direction and concept of development. The following areas of science, research are comprehensively evaluated in the report:

* scientific and research profile of FEMT,
* organizational, personnel, financial and material - technical provision of science and technology,
* publishing activities of the faculty,
* cooperation in the field of science and technology at home and abroad,
* scientific and professional events,
* science and technology projects,
* ŠVOČ,
* doctoral studies.

For clarity, most of the quantitative indicators and information are compiled into tables.

The adopted measures for 2018, resulting from the latestj Report on Scientific Research Activities, have been largely fulfilled.

The aim of the evaluation of the scientific research activities of FEMT was to create an objectivededuction of the faculty's activities for the year 2018, which was also the second year of fulfillment of the Long-Term Plan of the Faculty of Environmental and Production Technology of the Technical University in Zvolen for the years 2017 – 2023 with a vision for 2030. It was drawn up in accordance with the requirements of Act No. 131/2002 Coll. on Higher Education Institutions, as amended, and approvedonly by the Academic Senate of the FEMT. The long-term plan is the basic planning document for ensuring the development of the faculty in all key areas. The long-term objective is an open document, the implementation of the strategic objectives will be evaluated annually on the basis of defined indicators, the measures will be updated, if necessary, in accordance with the change in the internal and external conditions of its implementation.

Evaluating the implementation of the measures of the fields of scientific research and creative activity, it can be concluded that in the past year every faculty member has been involved insolving research projects. Thefaculty's ublical activity has a growing trend in the field of more valuable publications, the proportion of less valuable publications is decreasing, the qualificationstructure of faculty staff is improving. DphD students are actively involved in project solutions and publish in renowned database journals, the faculty carries out activities in the field of popularization of achieved results and visibility in national and international forums and events.

# SCIENTIFIC AND RESEARCH PROFILE OF FEMT

The basic platform of profiling of the Faculty of Environmental and Production Technology in Science and Research is activities in the context of its long-term intention. They represent the area of creation and protection of the working and environmental environment, as well as techniques for environmental protection from the negativeeffects of production processes, in the field of production technology with a focus on forestry and mobile technology, in woodworking machinery and equipment, in the management of machines and equipment, in industrial engineering and management with a focus on safety engineering and in the field of technical provision of production activity. An essential starting point for the focus of the scientific and research profile of FEMT is the know-how of the faculty, its personnel capabilities and material-technical base. In the above areas of science and research, the activity of the faculty in the submission of grant and scientific research projects is oriented. The financial envelope of scientific research tasks is mainly implemented through grant projects VEGA, KEGA, IPA and APVV. The largest part of the scientific research capacity of the faculty's staff and PhD students is used to solve the projects of the above-mentioned grant agencies.

## Orientation and supporting directions of research

The scientific and research profile of the faculty is based on the professional focus and mission of the faculty, which was reflected in the main directions of science and research at FEMT. The scientific and research activities of FEMT are built on the principle of maximum interconnectedness of pedagogical and scientific activities, respecting global trends and current transfer of knowledge into economic and social practice.

The content focus of the faculty's research activities is oriented to the main directions of research in the field of development and assessment of the quality of forestry and woodworking machines, reduction of material and energy intensity, use of new energy resources (permanently renewable resources, biomass), quality management of production enterprises.

The concept of FEMT's development objectives is based on the intentions of the development of science and technology in terms of world trends and the needs of society. The aim is also to ensure the uniform development of all accredited fields of study of the faculty and professional disciplines provided by individual departments.

The faculty will develop a long-term program of science and research for the modernization of the production base in the engineering, woodworking, forestry industries and for the development and improvement of environmental facilities. This will take into account the requirements of society and will be based on the needs of innovation in the teaching subjects of the faculty's fields of study. The strategy of FEMT TU in Zvolen is also aimed at developing contacts with universities in European countries in the form of bilateral agreements on scientific and research cooperation and student exchange. This opens up the potential and balance of research and teaching into a form of consistency between the orientation of research activity and accredited study programmes.

## Main areas and orientations of scientific research activity

The mission of the Faculty of Environmental and Production Technology is to develop creative scientific research and, on its basis, to provide higher education in all three levels in the Slovak and European research and education area.

In the field of research, it fulfils its mission by solving research projects and programs of a national and international nature, especially in the areas of agricultural and forestry sciences, engineering and technology, environmental sciences and ecology, engineering and management, human protection and integrated safety, as well as other related and application areas. Based on the Long-Term Intention of FEMT TU in Zvolen for 2017 - 2023 with a vision for 2030, the focus of scientific research activities is mainly concentrated on:

* techniques and technologies in the field of waste and secondary raw materials management,
* secondary and renewable energy sources,
* research into water and air protection techniques,
* machinery and mechanisms for woodworking and forestry technology,
* measuring and control systems with microcomputers and modular computer systems,
* use of traditional and special construction and tool materials,
* technological problems with an emphasis on the possibilities of implementing CA – technologies,
* production management, quality management, diagnostics and operational reliability of machines in relation to the environment,
* creation and management of production systems,
* integration of management systems and certification procedures.

To achieve this, the following measures are defined:

* publish the results of research and creative activities in the international environment, in particular in indexed renowned international scientific journals,
* strengthen the faculty's position in scientific research projects of national and international cooperation,
* build research infrastructure, including qualified operators,
* deepen the involvement of PhD students in research, subject to publication in indexed international scientific journals,
* build and ensure the effective dissemination and commercialisation of research results through a university technology transfer centre,
* to popularize and raise the profile of the results of scientific research and other creative activities of the faculty of professional public.

# ORGANIZATIONAL, PERSONNEL, FINANCIAL AND MATERIAL – TECHNICAL PROVISION OF SCIENCE AND TECHNOLOGY

## Scientific research capacity of FEMT and its qualification structure

The scientific research capacity consists of scientific and pedagogical staff and researchers, whom the faculty does not have. PhD students or students - diplomats are also involved in the scientific research capacity of FEMT and in solving research tasks.

It is recommended to base the planning of scientific research capacities on the following values:

|  |  |  |
| --- | --- | --- |
| pedagogical staff |  | 1000 h |
|  |  |  |
| internal PhD students | 1st year of study | 1000 h |
| 2nd year of study | 1500 h (max. 2000 h) |

The numbers and structure of the faculty staff constituting the basic scientific research capacity are shown in Table 2.1.

**Table 2.1** Qualification structure of FEMT staff by workplace

|  |  |  |  |
| --- | --- | --- | --- |
| Workplace | C o u n c il a t i on o f the | Together | Ofthe total number of |
| scientific and pedagogical staff |
| Prof. | .doc. | Oa | DrSc., Dr. | CSc., PhD. |
| KELT | 1 | 2 | 3 | 6 | 0 | 6 |
| KMSD | 0 | 3 | 5 | 8 | 0 | 8 |
| KVAT | 1 | 4 | 4 | 9 | 0 | 9 |
| KVTMKv | 0 | 4 | 2 | 6 | 0 | 6 |
| TOGETHER | 2 | 13 | 14 | 29 | 0 | 29 |

**Graph 2.1 Qualification structure** of FEMT staff

The research capacity spent on solving all research tasks is presented in Table 2.2, with an average of 1183 hours per reported FEMT teaching staff member.

**Table 2.2** Research capacity of FEMT teaching staff for grant

 and otherscientific staffin 2018 hours

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| WORKPLACE | VEGA GRANT PROJECTS | KEGA GRANT PROJECTS | OTHER PROJECTS | TOGETHER |
| KELT | 3100 | 950 | 300 | 4350 |
| KMSD | 3550 | 3400 | 1400 | 8350 |
| KVAT | 4900 | 4000 | 150 | 9050 |
| KVTMKv | 4800 | 2800 | 4950 | 12250 |
| TOGETHER | 16350 | 11150 | 6800 | 34300 |

Doctoral students are also involved in solving research tasks. Their research capacities are in Table 2.3

**Table 2.3** Research capacity of FEMT phD students for grant

 and otherscientific projects in hours in 2018

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| WORKPLACE | VEGA GRANT PROJECTS | KEGA GRANT PROJECTS | OTHER PROJECTS | TOGETHER |
| KELT | 3600 | 0 | 500 | 4100 |
| KMSD | 500 | 0 | 0 | 500 |
| KVAT | 5700 | 1100 | 150 | 6950 |
| KVTMKv | 1500 | 100 | 700 | 2300 |
| TOGETHER | 11300 | 1200 | 1350 | 13850 |

For one phD student at FEMT, the research capacity is 923 hours.

## Thematic concentration and financial provision of research at FEMT

In basic and applied research, the faculty focused on tasks and projects that will significantly contribute to minimizing the negative impacts of technology and technology on the living and working environment and reducing the material and energy intensity of equipment. A significant part of the research capacities are focused on research and development of new machinery and equipment for forestry and the timber industry.

The funds were obtained in the form of approved and solved grant projects, for which the main investigator of the project was fully responsible, in full respect of the Decree of the Ministry of Education of the Slovak Republic on the use of budgetary funds.

A summary overview of the funds allocated to the solution of grant and scientific and technical projects by chapteris given in Tables 2.4 and 2.5, graphically shown in Figure 2.2. A more detailed overview of the allocations for individual projects is given in Chapter 6.

**Table 2.4** Departments' allocations in 2018

 for VEGA and KEGA projects (in EUR)

|  |  |  |  |
| --- | --- | --- | --- |
| WORKPLACE | VEGA GRANT PROJECTS | KEGA GRANT PROJECTS | TOGETHER |
| Common | Capital | together | Common | Capital | together |
| KELT | 15581 | 0 | 15581 | 9998 | 0 | 9998 | 25579 |
| KMSD | 0 | 0 | 0 | 3917 | 0 | 3917 | 3917 |
| KVAT | 8769 | 0 | 8769 | 13474 | 0 | 13474 | 22243 |
| KVTMKv | 4946 | 0 | 4946 | 9747 | 0 | 9747 | 14693 |
| TOGETHER | 29296 | 0 | 29296 | 37136 | 0 | 37136 | 66432 |

**Table 2.5** Departments' allocations in 2018 for IPA, Inst. research, APVV, Other projects (in EUR)

|  |  |  |
| --- | --- | --- |
| WORKPLACE | PROJECTS IPA, INŠT. RESEARCH, APVV, OTHER  | TOGETHER |
| Ipa |  INST. RESEARCH | APVV | Other |
| Common | Capital | Common | Capital | Common | Capital | Common | Capital |
| KELT | 922 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 922 |
| KMSD | 833 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 833 |
| KVAT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| KVTMKv | 0 | 0 | 0 | 0 | 59955 | 0 | 0 | 0 | 59955 |
| FEMT | 0 | 0 | 6573 | 0 | 0 | 0 | 0 | 0 | 6573 |
| TOGETHER | 1755 | 0 | 6573 | 0 | 59955 | 0 | 0 | 0 | 68283 |

**Graph 2.2** Overview of funds allocated to project solutions by department

Table 2.6 gives an overview of the volume of allocated funds from the Ministry of Education of the Slovak Republic and funds from other programs.

**Table 2.6** Overview of the volume of funds allocated to address projects (in EUR)

|  |  |
| --- | --- |
| PROJECTS | ALLOCATIONS |
| VEGA | 29296 |
| KEGA | 37136 |
| IPA | 1755 |
| INSTITUTIONALRESEARCH | 6573 |
| APVV | 59955 |
| TOGETHER | 134715 |

Graph 2.3 below shows, for comparison, the evolution by volume of funding allocated to grant and other projects in 2016, 2017, 2018

**Graph 2.3** Allocations for projects in 2016, 2017, 2018

# PUBLICATIONS

## Evaluation of publication activity in 2018

The basic form of outputs of scientific research and creative activity is publishing and artistic activity, which was evaluated in accordance with Directive No. 13/2008-R on bibliographic registration and categorization of publishing activity and decree of the Ministry of Education of the Slovak Republic No. 456/2012 Coll. on the central register of records of publishing activity and the central register of records of artistic activity.

 Table 3.1 and Graphs 3.1 and 3.2 represent the publication activity followed by individual departments as well as years at the faculty. The overall publishing performance of FEMT its quality of publications is evaluated through the preferred categories A1 to D shows that publishing activity in 2018 has a relatively qualitatively increasing level, where in quantitative terms it still has a reasonable - average trend over the last three years.

Tables 3.1, 3.2 and the following graphs were drawn up from the departments' documents and according to the documents from the SLDK. The individual categories were determined according to the criteria of the Ministry of Education of the Slovak Republic and took into account the proportions of individual authors. This breakdown is important from the point of view of allocating funds for TU and FEMT, with prioritye being preferred subsidy categories. Based on the evaluation of publishing activity, it can be concluded that the share of categories A1, A2 has increased somewhat compared to previous years, and in category B this is a third decrease compared to the previous evaluation period. According to the current criteria, it is necessary to continue to focus on these types of publications in relation to the subsidy system of the Ministry of Education of the Slovak Republic. A very positive phenomenon is the evident increase in publications in category C, which have a certain benefit either from the point of view of evaluations of faculties, projects as well as career growth of faculty staff. From a global perspective, FEMT continues to maintain the established trend of publishing outputs per creative worker, which is also to some extent due to the persistent gradual decrease in the number of faculty staff.

**Table 3.1** Evaluation of publishing activities for individual departments according to the criteria of the Ministry of Education of the Slovak Republic for 2018 – employees

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| DEPARTMENT | A1 | A2 | B | C | D |
| KELT | together | 1,8 | 3,25 | 0,7 | 2,8 | 21,32 |
| average for the reporting staff of the department | 0,30 | 0,54 | 0,12 | 0,47 | 3,55 |
| KMSD | together | 0 | 2,5 | 0,5 | 2,14 | 8,83 |
| average for the reporting staff of the department | 0 | 0,31 | 0,06 | 0,27 | 1,1 |
| KVAT | together | 0 | 4 | 5,25 | 4,08 | 14,2 |
| average for the reporting staff of the department | 0 | 0,44 | 0,58 | 0,45 | 1,57 |
| KVTMKv | together | 1,24 | 2,5 | 0,35 | 7,9 | 27,9 |
| average for the reporting staff of the department | 0,21 | 0,42 | 0,06 | 1,32 | 4,65 |
| TOGETHER | 3,04 | 12,25 | 6,8 | 16,92 | 72,25 |
| AVERAGE PER WORKER  | 0,10 | 0,42 | 0,23 | 0,58 | 2,49 |

Note. 1:Group A1Book publications of the nature of a scientific monograph

 Group A2Other book publications

 Group BPublications in peer-reviewed scientific journals and copyright certificates, patents and discoveries

 Group CPublications in journals that are not peer-reviewed but are registered in WoS or Scopus databases

 Group OTHER PUBLICATIONS

**Graph 3.1** Evaluation of publishing activity in shares for individual departments according to the criteria of the Ministry of Education of the Slovak Republic for 2018 – employees

**Table 3.2** Utility models, designs ofFEMT staff for 2018

|  |  |  |
| --- | --- | --- |
| NUMBER | TITLE | NAME OF THE DESIGNER |
| Utility model No.8101/2018 | Device for reversing a combination of vehicles with trailer, semi-trailer | Pivarčiová Elena, Csongrády Tibor, Leško Nikita |
| Utility model no.8253/2018 | The mechanism of the wall-mounted wooden clock | Krajčovičová Mária, Kopčanová Silvia, Ohanka Jaroslav |
| Utility model No.8298/2018 | Equipment for measuring the cutting conditions of tools | Mikleš Milan, Kováč Ján, Helexa Milan, Krilek Jozef, Kuvik Tomáš |
| Utility model no.8372/2018 | Device for attaching the chainsaw cutting mechanism | Kuvik Tomáš, Krilek Jozef, Kováč Ján, Štefánek Milan |
| Application for utility model No. 35-2018 | Device for wearing the saw blade tooth | Krilek Jozef, Štefánek Milan, Blacksmith Ján, Kuvik Tomáš |
| Design No. 28475 | Logo – RoboPlaying, popularization of robotics on FEMT | Pivarčiová Elena, Kvočka Stanislav |

**Graph 3.2** Comparison of the number of outputs in each category of publishing activity

according to the criteria of the Ministry of Education of the Slovak Republic

Table 3.3 provides an assessment of the citation activity of individual faculty staff:

1 - In foreign publications registered in the Web of Science and the Scopus database

2 - In home publications registered in the Web of Science and the Scopus database

3 - In foreign publications not registered in the Web of Science and the Scopus database

4 - In domestic publications not registered in Web of Science and the Scopus database

**Table 3.3** Evaluation of citation activities for the2018 departments – staff

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DEPARTMENT | 1 | 2 | 3 | 4 |
| KELT | together | 56 | 2 | 7 | 47 |
| average for the reporting staff of the department | 9,33 | 0,33 | 1,17 | 7,8 |
| KMSD | together | 34 | 2 | 5 | 39 |
| average for the reporting staff of the department | 4,25 | 0,25 | 0,63 | 4,88 |
| KVAT | together | 77 | 18 | 13 | 46 |
| average for the reporting staff of the department | 8,55 | 2 | 1,44 | 5,11 |
| KVTMKv | together | 97 | 0 | 6 | 54 |
| average for the reporting staff of the department | 16,2 | 0 | 1 | 9 |
| TOGETHER | 264 | 22 | 31 | 186 |
| AVERAGE FOR FEMT REPORTING WORKER (29) | 9,10 | 0,79 | 1,07 | 6,41 |

Table 3.4 shows the H index according to the WoS database of FEMT executives.

Creative staff of FEMT as of 31.12.2018

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DEPARTMENT | NAME | TITLE | H index WoS /ALL DATABASESAs of 31.12.2017 | H index WoS /ALL DATABASESAs of 31.12.2018 |
| KELT | Kováč Ján doc. Ing. PhD. | associate professor with CSc./PhD. | 2 | 2 |
| Krilek Jozef doc. Ing. | associate professor with CSc./PhD. | 1 | 2 |
| Brodnianská Zuzana Ing. | odb. as. with CSc./PhD. | 1 | 1 |
| Helexa Milan Ing. | odb. as. with CSc./PhD. | 0 | 0 |
| Kuvik Tomáš Ing. PhD. | odb. as. with CSc./PhD. | 0 | 1 |
| Víglaský Jozef prof. Ing. | professor with CSc./PhD. | 1 | 1 |
| KMSD | Beňo Pavel doc. Ing. PhD. | associate professor with CSc./PhD. | 1 | 1 |
| Bodnár Ferdinand doc. Ing. CSc. | associate professor with CSc./PhD. | 1 | 1 |
| Kučera Marian doc. Ing. PhD. | associate professor with CSc./PhD. | 2 | 2 |
| Kotšmíd Stanislav Ing. | odb. as. with CSc./PhD. | 0 | 0 |
| Kvočka Stanislav Ing. ArtD. | odb. as. with CSc./PhD. | 0 | 0 |
| Matej Jaroslav Ing. PhD. | odb. as. with CSc./PhD. | 1 | 1 |
| Minárik Marián Ing. PhD. | odb. as. with CSc./PhD. | 0 | 0 |
| Turis Ján Ing. | odb. as. with CSc./PhD. | 0 | 0 |
| KVAT | Javorek Ľubomír doc. Ing. | associate professor with CSc./PhD. | 2 | 2 |
| Naščák Ľubomír doc. Ing. | associate professor with CSc./PhD. | 1 | 1 |
| Pivarčiová Elena doc. Mgr. PhD. | associate professor with CSc./PhD. | 2 | 3 |
| Clamp Ján doc. Ing. CSc. | associate professor with CSc./PhD. | 1 | 2 |
| Hrčková Mária Ing. PhD. | odb. as. with CSc./PhD. | 0 | 0 |
| Koleda Pavol Ing. | odb. as. with CSc./PhD. | 0 | 1 |
| Koleda Peter Ing. | odb. as. with CSc./PhD. | 0 | 2 |
| Krajčovičová Mária Ing. PhD. | odb. as. with CSc./PhD. | 0 | 0 |
| Barcík Štefan prof. Ing. CSc. | professor with CSc./PhD. | 8 | 9 |
| KVTMKv | Čierna Helena doc. Ing. PhD. | associate professor with CSc./PhD. | 0 | 0 |
| Dado Miroslav doc. Ing. | associate professor with CSc./PhD. | 1 | 2 |
| Hnilica Richard doc. Ing. PhD. | associate professor with CSc./PhD. | 2 | 2 |
| Kalincová Daniela doc. Ing. | associate professor with CSc./PhD. | 1 | 1 |
| Sujová Erika Ing. | odb. as. with CSc./PhD. | 1 | 2 |
| Ťavodová Miroslava Ing. PhD. | odb. as. with CSc./PhD. | 0 | 1 |

 It must be noted that the Methodological Guideline of the Dean "Rules and requirements for the doctoral study program PE at FEMT TU in Zvolen in AR 2017/2018", valid from 01.10.2017, had a positive effect on the publishing and citation activities of doctoral students in the evaluated year. There has been an "enormous" increase in publishing outputs, mainly in categories B, C and D, as well as in the citation effect of the individual categories evaluated compared to previous periods.

In particular, the publishing and citation activities of doctoral students of the departments for the year 2018 were evaluated at the Faculty of Environmental and Production Technology of the Tu in Zvolen, which is presented in Tables 3.5 and 3.6 and in Graph 3.3.

**Table 3.5** Evaluation of publishing activities for individual departments according to the criteria of the Ministry of Education of the Slovak Republic

 2018 – PhD students

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| DEPARTMENT | A1 | A2 | B | C | D |
| KELT | together | 0 | 0 | 0,3 | 0.4 | 5,10 |
| average for phD student of the department | 0 | 0 | 0,05 | 0,07 | 0,85 |
| KMSD | together | 0 | 0 | 0 | 0,55 | 4,2 |
| average for phD student of the department | 0 | 0 | 0 | 0,18 | 1,4 |
| KVAT | together | 0 | 0 | 0,15 | 3,13 | 5,00 |
| average for phD student of the department | 0 | 0 | 0,02 | 0,35 | 0,55 |
| KVTMKv | together | 0 | 0 | 0 | 0,55 | 4,2 |
| average for phD student of the department | 0 | 0 | 0 | 0,18 | 1,4 |
| Together | 0 | 0 | 0,45 | 4,63 | 18,5 |
| AVERAGE PER FEMT PHD STUDENT (21) | 0 | 0 | 0,02 | 0,22 | 0,88 |

**Graph 3.3** Evaluation of the publication outputs of PhD students per department

Table 3.6 shows the assessment of the citation activity of individual PhD students in the categories:

1 - In foreign publications registered in the Web of Science and the Scopus database

2 - In home publications registered in the Web of Science and the Scopus database

3 - In foreign publications not registered in the Web of Science and the Scopus database

4 - In domestic publications not registered in Web of Science and the Scopus database

**Table 3.6** Evaluation of citation activities fromand individual departments for 2018 – PhD students

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DEPARTMENT | 1 | 2 | 3 | 4 |
| KELT | together | 2 | 0 | 0 | 0 |
| average for the reported PhD student of the department | 0,33 | 0 | 0 | 0 |
| KMSD | together | 0 | 0 | 0 | 0 |
| average for the reported PhD student of the department | 0 | 0 | 0 | 0 |
| KVAT | together | 7 | 3 | 2 | 4 |
| average for the reported PhD student of the department | 0,77 | 0,33 | 0,22 | 0,44 |
| KVTMKv | together | 4 | 0 | 1 | 2 |
| average for the reported PhD student of the department | 1,3 | 0 | 0,3 | 0,7 |
| TOGETHER | 13 | 3 | 3 | 6 |
| AVERAGE PER FEMT PHD STUDENT (21) | 0,62 | 0,14 | 0,14 | 0,29 |

The following table and graph provides an overview of the implementation, management and organisational activities of individual FEMT employees for the period 1.1.2018 – 31.1.2.2018 in categories:

A. Implementation activity,

B. Management and organisational activities in the field of science and technology,

C. Assessment activity.

**Table 3.7**  Scores of FEMT departments in each category for 2018

|  |  |  |  |
| --- | --- | --- | --- |
| Department | A | B | C |
|
| KELT | 5,66 | 27 | 35 |
| Average per reporting person | 0,94 | 4,5 | 5,83 |
| KMSD | 3,45 | 28 | 66 |
| Average per reporting person | 0,43 | 3,5 | 8,25 |
| KVAT | 25 | 30 | 73 |
| Average per reporting person | 2,77 | 3,33 | 8,11 |
| KVTMKv | 4 | 22 | 22 |
| Average per reporting person | 0,7 | 3,7 | 3,7 |
| TOGETHER | 38,11 | 107 | 196 |
| AVERAGE FOR FEMT REPORTING WORKER (29) | 1,31 | 3,69 | 6,76 |

**Graph 3.4** Evaluation of the activities of FEMT departments in oneof the categories for 2018

# CO-WORKING IN SCIENCE AND TECHNOLOGY AT HOME AND ABROAD

## Cooperation with higher education institutions

The Faculty of Environmental and Production Technology has developed cooperation with higher education institutions throughout the Slovak Republic and also with many foreign higher education institutions and their staff.

They cooperate not only in the pedagogical field within the framework of the latest information and knowledgein pedagogy, but also scientific researchactivities in solving specific grant projects. FEMT staff are also engaged in assessment and expertise activities, they are members of commissions for the improvement of scientific and pedagogical qualifications, etc.

### FEMT's cooperation with domestic university departments

* Slovak University of Agriculture in Nitra

Faculty of Technology, Prof. Zdenko Tkáč, PhD., doc. Ing. Ivan Janoško, CSc.; Dr.. h.c. Prof. Pavol Findura, PhD., doc. Ľubomír Hujo, PhD., doc. Ing. ;

Faculty of Economics and Management, Prof. Dr. Elena Horská;

* University of Žilina

Faculty of Mechanical Engineering, Prof. Jozef Pilc, CSc., Prof. Dr. Miroslav Neslušan, prof. RNDr. Milan Malcho, PhD., prof. Jozef Jandačka, PhD., doc. Ing. Andrej Kapjor, PhD., doc. Štefan Papučík, PhD., doc. Radovan Nosek, PhD., Doc. Jozef Bronček, PhD., Department of Materials Engineering prof. E. Tillová, PhD., Department of Industrial Engineering doc. Ľ. Dulina, PhD., Department of Machining and Production Technology prof. Ing.

Faculty of Electrical Engineering, Prof. Klára Čápová, PhD., Prof. M. Dado, PhD.;

* Slovak University of Technology in Bratislava

Faculty of Materials Technology, Prof. Maroš Soldán, PhD., Dr.h.c. prof. Pavol Božek, CSc., doc. RNDr. Karol Hatiar, CSc., Kamil Trnka, Doc. Marta Kučerová, PhD: Institute of Materials - Doc. Ing. Caplovic,PhD.,

Faculty of Mechanical Engineering, Prof. Marián Peciar, PhD., doc. Lešinský, CSc., Michal Bachratý, PhD., doc. Marián Rabbit, CSc., doc. Ľuboš Magdolen, PhD., prof. Ladislav Gulan, PhD.,

Faculty of Chemical and Food Technology, Bratislava, doc. V. Chovancová, CSc., Prof. I. Hudec, PhD. - Director of the Institute of Polymeric Materials;

Faculty of Electrical Engineering and Informatics, Prof. Viktor Ferencey, CSc.;

* Technical University of Košice

Faculty of Mechanical Engineering, Prof. Peter Horbaj, PhD., Prof. Mária Čarnogurská, CSc., Prof. Augustín Varga, CSc., doc. Ján Kizek, PhD., doc. J. Brezinová, PhD., doc. Ing. D. Jankura, PhD., prof. Ing. E. Lumnitzer, CSc.;

Faculty of Metallurgy, doc. J. Petrík, PhD., doc. Ing. Jarmila Trpčevska, PhD.

Faculty of Electrical Engineering, Prof. Ján Mihalík, CSc., Prof. Dušan Marchevský, CSc.;

Faculty of Production Technologies based in Prešov, Prof. Jozef Zajac, CSc.;

* Matej Bel University in Banská Bystrica

Faculty of Natural Sciences, Prof. PaedDr. Milan Ďuriš, CSc., externally - Prof. M. Piatrik, PhD., Prof. RNDr. Iveta Marková, PhD., doc. A. Očkajová, CSc., prof. PhDr. P. Fobel, PhD. ;

* University of St. Petersburg Cyril and Methodius in Trnava

Faculty of Natural Sciences, doc. Ing. Stanislav Hostin, PhD.;

**Dubnica Institute of Technology in Dubnica nad Váhom** prof. Ladislav Várkoly, PhD., doc.

### FEMT's cooperation with foreign university departments

* Vysoké učení technické v Brno, prof. Milan Pavelek, CSc., doc. Miroslav Škopán, Faculty of Mechanical Engineering inženýrství Ing. Z. Smékal, CSc., Czech Republic;
* Czech Technical University in Prague, Faculty of Electrical Engineering, Prof. S. Ďaďo, DrSc., Prof. M. Laipert, CSc., Faculty of Mechanical Engineering, Martin Hlinovský, Ph.D., Libor Reif, CSc., Institute of Mechanical Engineering Technology, Ing. Kudláček, Faculty of Technology,
* Czech University of Agriculture in Praza, Faculty of Forestry and Dřevařská Prague, doc. Jiří Dvořák, Ph.D., doc. Milan Gaff, Ph.D., Faculty of Technology Prague, Prof. Vladimír Jurča, CSc., Prof. Martin Libra, CSc. , Doc. Z. Aleš, Ph.D., Prof. M. Müller, PhD., Czech Republic;
* Palacký University in Olomouc, Industrial Laboratory of Optics, RNDr. Jiří Keprt, DrSc., Czech Republic;
* Czech University of Agriculture in Pilsen, Faculty of Mechanical Engineering, Prof. Dr. A. Kříž, Czech Republic;
* Technical University of Ostrava – doc. J. Kionka, CSc., doc. Dr. J. Punčochář, CSc., Faculty of Security Inženýrství Ing.
* Upper Silesian University of Business, Dr. Ing. Gabryšová, Czech Republic;
* Jan Evangelisty Purkyně University, Ústí nad Labem, Faculty of Mechanical Engineering, doc. Natasha Náprstková, Ph. D., Czech Republic;
* University of Silesia in Opava, Faculty of Entrepreneurship in Karviné; RNDr. R. Jewelry, PhD., Czech Republic;
* Mendel University in Brno, Faculty of Lesnická a dřevařská, doc. D. Tesařová, PhD., prof. Miroslav Rousek, CSc., doc. Ing, Zdenko Kopecký, PhD., doc. Karel Janák, CSc., L. Hlásková, PhD., Faculty of Agronomy, Doc. Ing. Čupera, Ph.D., Czech Republic;
* University of Pardubice, Faculty of Chemistry and Technology, Prof. P. Kalenda, CSc., Prof. A. Kalendová, Dr., Czech Republic;
* Technical University, Faculty of Mechanical Engineering, Liberec, Eva Nováková, PhD., Czech Republic;
* University of West Bohemia in Pilsen, Faculty of Mechanical Engineering, Marek Bureš, PhD., Prof. Dr. Antonín Kříž, Czech Republic;
* Voronezh State Academy of Forestry Engineering, Prof. Dr. Tech. Sci. Larissa I. Belchinskaya, Russia;
* University of Life Sciences – SGGW, Faculty of Forestry and Wood Technology, Warsaw, prof. Dr. hab. Krzysztof J. Krajewski, Dr.hab. Piotr Borysiuk, prof. dr. hab inž. Ewa Dobrowolska, Poland;
* SGGW, Faculty of Production Engineering Warszawa, prof. dr. Hab. Jerzy Wiesik, Poland;
* Warsaw University of Life Science, Prof. Dr. Hab. Inž. Ewa Dobrowolska, Poland;
* AR, Department of Mechanizacji Prac Lesnych Krakow, prof. dr. Hab. Józef Walczyk, Dr. Hab. inž. Pawel Tylek, Dr. Hab. inž. Krzystof Slowiňski, Dr. Hab. inž. M. Kormanek, Poland;
* Ukrainian derzavnyj lisotechničnyj universytet Lviv, prof. Nestor J, Bybljuk, DrSc., doc. Oleg Styranivsky, Ph.D., doc. Oleg Magura, Ph.D., doc. I. Rebeznyuk, Ph.D., Ukraine;
* Nyguat-Magyarországi Egyetem Šoproň, prof. Belo Horváth, prof. Z. Kovacs, prof. Etele Csanady, PhD. Hungary;
* University of Zagreb, Faculty of Forestry, Prof. Dr. Sc. Marian Šušniar, doc. Dr.Sc. Igor Dukič, Prof. R.B. Lukič, PhD., prof. Dr. Sc. With. Pervan, PhD., Croatia;
* Kazan National Research Technological University, Prof. Ruslan R. Safin, DrSc., Russia;
* Belarusian State University, Minsk, doc. Pavel M. Rudak, PhD., Belarus;
* Volga State University of Technology, Yoshkar Ola, doc. Evgeny Y. Razumov, CSc, Russia;
* Voronezh State Academy of Forestry Engineering, Prof. Dr. Tech. Sci L. I. Belychinskaya, Russia;
* Instytut Technologii Mechanicznej, Wydział Budovy Maszyn i Zarządzania, Politechnika Poznańska, Poznań , Dr. inž. Bartosc Palubicki, Poland;
* University of Rijeka, Faculty of Engineering, Prof. T. Mikac, Croatia;
* Josip Juraj Strossmayer University of Osijek, Mechanical Engineering Faculty in Slavonsky Brod, Prof. D. Kozak, Croatia;
* Technical University of Sofia, Prof. G. Popov, Bulgaria;
* University of Forestry, Faculty of Forest Industry Sofia, doc. Ing. Zhivko Gochev. PhD, Bulgaria;
* [Gdansk University of Technology](https://www.researchgate.net/institution/Gdansk_University_of_Technology), [Faculty of Mechanical Engineering](https://www.researchgate.net/institution/Gdansk_University_of_Technology/department/Faculty_of_Mechanical_Engineering), Dr. Mieczyslaw Siemiatkowski), Prof. Dr. Hab. Inž. Kazimierz Orlowski, Poland;
* Transilvania University of Brasov, Brasov, Prof. M. Ispas, Romania;
* Politechnika Koszalińska, Wydział Mechaniczny, prof. nadzw. dr hab. inż. Witold Gulbiński, prof. nadzw. dr hab. inż. Krzysztof Rokosz, prof. nadzw. Dr.. Hab. Inz. Jerzy Chojnacki, Poland;
* University of Maribor, Faculty of Mechanical Engineering, prof. Dr. T. Kreže;
* Silesian University of Technology, Faculty of Organization and Management, Institute of Production Engineering, Prof. W. Bialy, Republic of Poland;
* Ryerson University, Toronto, Ontario, Dept. of Mechanical & Industrial Engineering, Prof. David Nayolor, Ph.D., P. Eng., Canada;
* University of L'Aquila, Department of Industrial and Information Engineering and Economics, Stefano Sfarra, PhD., Italy;
* State Forest Technical University, State institution of Higher profesional Education, Saint-Petersburg, doc. Sergey Spiridov, Republic of Russia;
* Kalashnikov Izhevsk State Technical University, Izhevsk, Assoc. Prof. PhD. Yury R. Nikitin, Republic of Russia;
* Szechenyi István University,Gyór, E. Horváth, Hungary;
* National Chi Nan University, Department of Civil Engineering , Puli, TaiwanProf. Chang-Hung Kuo, PhD. ;
* Universita di Bologna, Cristiano Fragassa, Italy.

## FEMT's cooperation with professional workplaces

FEMT staff cooperates with various institutions in solving projects, their development and implementation work, in arranging operational exercises, within the framework of diploma theses.

* HIVUS s.r.o. , Žilina, Jaroslav Kocian;
* K-system, s.r.o., Žiar nad Hronom, Ľudovít Červenýk, Andrea Kúdelová;
* Zvolenská teplárenská, a.s., Zvolen, Ing. Jozef Petrinec;
* Doka Drev, s.r.o, Banská Bystrica, Štefan Mátik;
* DETOX, s.r.o., Plant Banská Bystrica, Katarína Babková, Karina Paulíny, PhD.;
* VIMAR Ecological boilers VIGAS, Slovenská Ľupča, Pavel Vigaš;
* Wastewater treatment plant Rakytovce, Banská Bystrica, Pavol Badinský;
* Euroheat SK, s.r.o. , Bratislava, Ján Karman;
* SHMÚ Banská Bystrica, RNDr. Jana Podolinská;
* SECOLÓG, s.r.o., Brezno (Landfill) – Richard Bergel, PhD.;
* Slovak Academy of Sciences, Institute of Polymers, Department of Theoretical and Applied Polymer Research, Bratislava, Igor Novák, CSc., Institute of Electrical Engineering, M. Polák, DrSc.;
* Research Institute of Plastic Substances, Nitra, Dana Červinková, Eva Lukáčiková;
* PPS Group, a. s., Detva, Complex PPS Group a.s., Tajovského 7, 962 12 DETVA, Vladimír Ľalík, Jozef Klimo, Ing. Golian ;
* LKT, s. r. o., Trstená; Štefan Furdek 270/12, **Peter Šinál**;
* ESSEL Slovenská Lupča, Ing. Szylágy;
* Forest Technology Plant Banská Bystrica, Sivčo, Franta PhD.;
* Continental Automotive System Slovakia, Zvolen, Zvolen, Slovakia, p. Šimiak, (contractual cooperation, Ing. J. Salay, Ing. R. Hraško;
* BRC Slovakia, s. r. o., Drmla, Ing.
* SLAVIA PRODUCTION SYSTEMS a.s., Detva, Dobrota, Michal Kucej, Jana Kucejová;
* IPM Engineering, s.r.o., Zvolen, Ing. Pauliny, PhD.
* INOVAL Ladomeská Vieska , Slovak Academy of Sciences, Institute of Materials and Mechanics machineov SAS , Dr. František Simančík, Ing.
* Institute of Material Research SAS, Košice, RNDr. Miroslav Džupon, PhD.;
* ŽOS Zvolen, a. s. Zvolen, Ing. Ľ. Martinská, Ing. Marcinek ;
* Ironworks Podbrezová, a. s., Podbrezová , Ing.
* Hriňovské strojárne, a. s., Hriňová , Ing. A. Krnáčová;
* Mint Kremnica, š. p., Kremnica (contractual cooperation), R. Kaštan, PhD.;
* GeWiS Slovakia, spol. s r. o., Handlová , Ing. L. Mazúrová;
* NEMAK Slovakia, s.r.o., Žiar nad Hronom, R. Palacka, PhD.;
* Foundry Hronec, a. s. , Ing.
* Fronius, a. s., Slovakia , Bc. P. Acs;
* Slovak Society for Quality – PS " Education and Training" Ing.
* Slovak Welding Company, Pavol Radič;
* K – Kosorín system, Ing.
* STATON , Turany , Ing. Morgoš;
* WAY Industries Krupina a.s., Ing. Macko, Ing. Škoda;
* Ironal, s. r. o., Banská Bystrica, Ing.
* Certification bodies: PQM s.r.o. Banská Bystrica., Ing. Snopek;
* ITQ – CZ s.r.o. Žilina;
* CADvision, s.r.o. Martin, Mihálik;
* DAVOS trade- logistics, s.r.o. Semolina , M. Dado;
* KOVACO, s.r.o., Veľká Lehota, Hanes, Ing.
* FOREST MERI, s.r.o., Martin, Šmíd;
* SITTRANS, s.r.o. Banská Štiavnica, Juraj Blahút;
* KWD s.r.o. Elected;
* SPIG s.r.o. Zvolen, Ing. Slabina;
* ROYAL FOREST, s.r.o. Sokoľ, Jaroslav Sepeši;
* GRD s.r.o., Ing. M. Gregáň;
* FIBERPLAST s.r.o., Miroslav Ďurica;
* CARBONTECHNIC, s.r.o., Ing.
* Research Institute of Welding Industrial Institute of the Slovak Republic, Ing.
* CEIT Engineering Services, s.r.o. Žilina, Ing.
* DEVEX, s.r.o., Vígľaš – Pstruša;
* Schier Technik Slovakia s.r.o., Trenčín, Katarína Hrabovská;
* PMS Delta s.r.o. Michalovce, RNDr. Peter Spišák, CSc.;
* Slovak Society for Tribology and Tribotechnics, RNDr. Pavol Klucho, Jozef Stopka;
* Slovak Institute for Standardization, Metrology and Testing – Technical Commission No. 62;
* IDEA StatiCa s.r.o. Jihomoravské innovation centre, Brno, Klára Thielová;
* National Instruments, s.r.o. Prague, Pavel Krčil;
* International Organization for Standardization, Technical Committee 213, Dimersional and geometrical product specifications and verification, Geneva, Switzerland;

# SCIENTIFIC AND PROFESSIONAL EVENTS OF FEMT

In 2017, the departments of the Faculty of Environmental and Production Technology organized or participated in the co-organization of the following scientific and professional events:

Name of department: **KVAT**

*Type of event:* *Roboplay 2018* robot competition for high school and university students TUZVO

Date of the event:  **30.1.2018**

*Expert guarantor:* Doc. Mgr. Elena Pivarčiová, PhD.

Number of participants: - domestic: 19 competitors, 20 guests

*Event focus:*  robotics, algorithmics, programming

Name of department: **KVAT**

*Type of event:* **Roboplay 2018** competitive robot show for primary school

Event date:  **06/02/2018**

*Expert guarantor:* Doc. Mgr. Elena Pivarčiová, PhD.

Number of participants: - domestic: 37 competitors, 30 guests

*Event focus:*  robotics, construction, algorithmization, programming

Name of department: **KVAT**

*Type of event:* practical Wokshop for primary school in Revúca

Date of the event:  **3.10.2018**

*Expert guarantor:* Doc. Mgr. Elena Pivarčiová, PhD.

*Number of participants:* - domestic: 23

Event focus: robotics, construction, algorithmization, programming

Name of department: **KVAT**

Type of event: practical Wokshop for secondary vocational school in Púchov

Event date:  **12/10/2018**

*Expert guarantor:* Doc. Mgr. Elena Pivarčiová, PhD.

Number of participants: - domestic: 22

 Event focus: robotics, construction, algorithmization, programming

Name of department: **KVAT**

*Type of event:* Workshop for primary school in B. Bystrica

Date of the event:  **17.12.2018**

*Expert guarantor:* Doc. Mgr. Elena Pivarčiová, PhD.

Number of participants: - domestic: 22

 Event focus: robotics, construction, algorithmization, programming

Name of department: **KVAT**

*Type of event:* practical workshop for the Private Secondary Technical School in Žiar nad Hronom

Date of the event:  **18.12.2018**

*Expert guarantor:* Doc. Mgr. Elena Pivarčiová, PhD.

Number of participants: - domestic: 13

*Event focus:*  robotics, construction, algorithmization, programming

Name of department: **KVAT**

*Type of event:* practical workshop for the Secondary Vocational School of Woodworking zvolen

Date of the event:  **19.12.2018**

*Expert guarantor:* Doc. Mgr. Elena Pivarčiová, PhD.

Number of participants: - domestic: 22

*Event focus:*  robotics, construction, algorithmization, programming

Name of department: **KVAT**

*Type of event:* practical workshop for the Secondary Industrial School of Transport Zvolen

Event date:  **20.12.2018**

*Expert guarantor:* Doc. Mgr. Elena Pivarčiová, PhD.

Number of participants: - domestic: 9

Event focus: robotics, construction, algorithmization, programming

Name of department: **KVTMKv**

*Type of event:* Professional course accredited by the Ministry of Education of the Slovak Republic

Date of the event:  **10-11/05/2018**

*Professional guarantor:* Helena Čierny, PhD.

Number of participants: - domestic: 29

 - foreign: 1

*Focus of the event:* The quality manager course according to ISO 9001:2015 is designed for students of a technical university and professional practice. After completing the lectures, solving the case studies, as well as after drawing up the final test, the participants of the course receive the Quality Manager certificate, which will allow them to be more applicable in practice, as well as increase their credit to other students.

Name of department: **KVTMKv**

*Type of event:* Scientific colloquium on the solution of the KEGA project No. 011ZUZ-4/2017

Date of the event:  **29.5.2018**

*Professional guarantor:* Helena Čierna, PhD.

Number of participants: - domestic: 8

 - foreign: 2

*Focus of the event:* Scientific colloquium on the solution of the KEGA project no. 011ZUZ-4/2017

Title of proceedings: Ways and potential procedures for integrating progressive information

 Technologies and soft – skills in production processes

  **FEMT**

*Type of event:* **XXth International Scientific Conference of Young Scientists**

Date of the event:  **25-27.**  **June 2018**

*Expert guarantor:* Marián Kučera, PhD. , Dean of FEMT

Number of participants: - domestic: 35

 - Foreign: 12

*Focus of the event:* The international scientific conference is intended for phD students and young scientists (up to 35 years old) of universities and scientific institutes focused on the field of machinery and production equipment in agricultural, forestry and food production, on the marketing of machines and technical systems.

*Aim of the conference:* development trends in hydraulic elements, systems and fluids used in agricultural, forestry and production technology, automation, robotization and informatics, energy and environment, quality and reliability of machines and equipment, technique and mechanization of agriculture and forestry, technique of production processes, properties and processing of agricultural and forestry materials and products, marketing of machines and safety of technical systems.

 Name of workplace: **FEMT**

*Type of event:* **"Science and Technology Week 2018" at FEMT- Career Day –** Expert lectures and practical demonstrations for students aimed at linking study with practice.

Event date: 06/11/2019

*Expert guarantor:* Marián Kučera, PhD., Dean of FEMT

Number of participants: - domestic: 180

*Focus of the event:*

Professional lectures of companies:

PPS Group, a. s. Detva

SLAVIA PRUCTION SYSTEMS a.s., Detva

GEVORKYAN, s.r.o. Vlkanová

KOVACO, s.r.o. Sharp Meadow

Continental Automotive Systems Slovakia s.r.o., Zvolen

BROTHER INDUSTRIES (SLOVAKIA) s.r.o., Krupina

Fronius Slovensko s.r.o., Banská Bystrica

# SCIENCE AND TECHNOLOGY PROJECTS

## Grant projects VEGA, KEGA

In 2018, 5 VEGA projects and 6 KEGA projects were solved at FEMT.

**Table 6.1** Allocations forthe 2018 VEGA grant projects (in EUR)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| PROJECT NO | PROJECT NAME | PROJECT LEADER | DEPARTMENT | SOLUTION TIME | ALLOTTED |
| Bv | Kv |
| VEGA 1/0086/18 | Research of temperature fields in a system of shaped heat exchange surfaces | Černecký Jozef Pivarčiová Elena | CELT | 2018- 2021 | 7200 | 0 |
| VEGA 1/0642/18 | Analysis of the impact of structural parts of forestry mechanisms in the forest environment in terms of energy and ecological | Kováč Ján | CELT | 2018 -2020 | 5521 | 0 |
| VEGA 1/0315/17 | Research of relevant properties of thermally modified wood in contact phenomena in the machining process with prediction of obtaining an optimal surface | Štefan Barcík | KVAT | 2017- 2019 | 8769 | 0 |
| VEGA 1/0826/15 | Research of cutting mechanisms in the process of processing wood mass | Jozef Krilek | CELT | 2015- 2018 | 2860 | 0 |
| VEGA 1/0531/15 | Increasing the service life of tools and structural parts of mechanisms used in forestry technologies | Richard Hnilica | KVTMKv | 2015- 2018 | 4946 | 0 |
| TOGETHER | 29 296 | 0 |

**Results achieved in solving VEGA projects in 2018**

**COMPLETED PROJECTS:**

**VEGA 1/0826/15 Research of cutting mechanisms in the process of processing wood mass**

**doc. Ing. Jozef Krilek, PhD.**

Achievements:

The essence of the scientific project was the examination of selected cutting mechanisms in order to determine their optimal technical-technological parameters and the deepening of theoretical knowledge in the cutting and initial processing of wood. By measuring the impact of the properties of wood in the interaction process of burning and the initial processing of wood in terms of wood species, its anisotropy, humidity, technical-technological factors and forest technology, following the energy intensity of the cutting process, technical parameters have been found in which the energy intensity values are optimal for the favorable performance of wood cutting. The obtained results from material research of cutting tools and analyses expand the areas of knowledge of the workpiece-tool interaction in the process of processing the influence of technical-technological factors for selected cutting tools.

 Based on theoretical analyses, experimental measurements and their evaluation, 4 utility models were proposed, 2 scientific monographs were published, 2 scientific articles in CCC, 6 articles in WOS and SCOPUS, and another 45 scientific articles at various conferences and journals.

**VEGA 1/0531/15 Increasing the service life of tools and structural parts of mechanisms used in forestry technologies**

**doc. Ing. Richard Hnilica, PhD.**

Achievements:

The result of the project solution is, based on input analyses, trials, tests and evaluations carried out on samples of materials, the determination of appropriate procedures and methods to increase the service life of tools by reducing their abrasion resistance and thus improving the ability to withstand the influence of an abrasive heterogeneous environment. This determination was preceded by an analysis that determined the exposed places on the tools and structural parts of the mechanisms that are subject to abrasive and impact loads. The basic proposed procedures were the processes of heat treatment of the material – hardening with subsequent tempering and cementation. Furthermore, various types of hardening materials have been selected, laboratory and partly operationally tested . These were applied by MMA, MAG and flame welding methods to exposed parts of tools and structural parts of mechanisms. The proposed procedures and methods to ensure higher abrasion resistance of exposed parts of tools and structural parts of mechanisms used in forestry technologies will help to increase their service life in operation. This represents a real saving of funds associated with the purchase of a new instrument, which will also be reflected in the economy of companies managing forests of the Slovak Republic.

**VEGA 1/0642/18 Analysis of the impact of structural parts of forestry mechanisms in the forest environment from an energy and ecological point of view.**

**doc. Ing. Ján Kováč, PhD.**

Achievements:

The project is focused on theoretical analysis and experimental verification of forestry adapters in the processing of wood and biomass in order to determine their optimal parameters in the machine-tool-object system of work, to determine the cutting conditions, the durability of the cutting edge and the durability of the tools, as well as to analyze the shapes of cutting tools. Research on interdependencies between the running systems of mining equipment with land from an energy and ecological point of view.

**ONGOING PROJECTS:**

**VEGA 1/0086/18 Research of temperature fields in a system of shaped heat exchange surfaces .**

**doc. Mgr. Elena Pivarčiová, PhD. (prof. Jozef Černecký, CSc.** **)**

Achievements:

During the first year of the project, 3 scientific papers were published in foreign journals registered in web of science databases, SCOPUS, 1 inscientific work in other domestic journals, 1 paper at a foreign scientific conference and 1 abstract paper at a domestic conference.

**VEGA 1/0315/2017 Research of relevant properties of thermally modified wood in contact phenomena in the machining process with prediction of obtaining an optimal surface.**

**Štefan Barcík, CSc.**

Achievements:

As part of the 2nd stage of the VEGA project solution, experiments and their statistical evaluations were carried out, aimed at monitoring the impact of independent technical, technological, material and tool factors on the energy intensity and quality of machining of two thermally modified trees (SM,DB) from the point of view of optimizing the machining process. Comprehensively processed outputs from these experiments have been continuously published both in registered journals (CC, WofS, Scopus... ) as well as in the IGC. At the end of this stage, the technical- technological and other conditions were prepared to ensure the last stage of the project in 2019.

Staff of FEMT KVTMk doc. Ing. Dado, PhD., doc. Ing. Sujová, doc. R. Hnilica, PhD. participated in the solution of VEGA projects at other faculties (FEE. TU) and universities (UMB FF).

**VEGA 1/0377/17** Research on the synergistic effectof the interaction between noise and ototoxic substancesin hazardous forestryand woodworking enterprises

**doc. Marián Schwarz, CSc. (FEE)**

Achievements:

In the second year of the solution, a model experiment was designed and implemented to investigate the combined exposure to noise and potential ototoxic substances contained in the exhaust exhalates during the operation of the chainsaw. The evaluation of the synergistic effect of noise and ototoxic substances showed that the physical factor, i.e. noise, exceeds the exposure limits when working with a chainsaw, but this can be effectively reduced with the help of personal protective equipment (hearing protectors). Exceedances of exposure limits for interacting hazardous chemical agents were only recorded for BTEX. Confirmation of the synergistic effect of noise and ototoxic substances will require detailed audiometric examinations in the next phase of research, through which it would be possible to demonstrate a correlation between workers' hearing impairment and concentrations of hazardous chemical agents (ototoxic substances).

**VEGA 1/0187/16** Post - fundamentalism as a perspective in (applied) ethics

**Prof. PhDr. Pavel Fobel, PhD. (UMB FF)**

Achievements:

The investigators justified and preceded the position of the methodological paradigm – post-fundamentalism in contemporary (applied) ethics. The theoretical work of the solvers, in accordance with the objectives, leaned towards the belief that post- fundacionalism is a theoretically and application-important approach in applied ethics or in individual application procedures. For ethical sensibility and the enhancement of ethical culture, suitable built-up and used case studies, moral imagination and recognition of moral expectations, solving current moral dilemmas, demonstrations of good but also bad practice, acquisition of soft competencies have a significant impact.

An employee of the Department of KVTMKv doc. R. Hnilica, PhD. participated in the solution of the VEGA project at the LF.

**VEGA 1/0471/17/8** Modelling of technical, economic and environmental parameters

removal of wood in the conditions of forestry of the Slovak Republic.

**Valéria Messingerová, CSc. (LF)**

Achievements:

As part of the second phase ofthe project, the data from the roadscanner laser scanning machine were evaluated and processed, while the use of the above method for monitoring and rapid assessment of the condition of the forest road network used for timber removal was evaluated and processed. As part of the research activity, the results of the analysis of occupational accidents in wood removal in the Forests of the Slovak Republic š.p. over a period of 10 years were also published in scientific journals of the Current Contents category. From the above research, relevant results are available to improve the OSH of the employees of the company Lesy SR š.p. in the above activities. Since last year, work has continued on a scientific monograph entitled "Removal of wood current state in Slovakia and its prospects for development in the future". A map base with the distribution of the forest road network on the territory of the VŠLP TU Zvolen (LS Budča) has been developed, into which the locations of individual transport points will then be inserted. In the research area, the collection of empirical material for further analysis continues.

J. Turis, PhD. from KMSD is in the research team at TF SPU Nitra.

**VEGA 0155/18 Applied research on the use of ecological energy carriers in agricultural, forestry and transport technology**

**doc. Ľubomír Hujo, PhD. (TF SPU Nitra)**

Staff from the Department of KVAT prof. Štefan Barcík, CSc. and Pavol Koleda, PhD. participated in the solution of the VEGA project at DF.

**VEGA1/0725/16 Prediction of the quality of the formed surface when milling growl wood with stem razor cutters on CNC machining milling cutters. 2016-2018).** Commission No.8 for Agriculture, Forestry and Veterinary Sciences.

**Richard Kminiak, PhD.**

In 2018, 6 KEGA projects were solved.

**Table 6.2**  Allocations forKEGA dg projects in 2018 (in EUR)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| PROJECT NO | PROJECT NAME | PROJECT LEADER | DEPARTMENT | TIME | ALLOTTED |
| SOLUTIONS | Bv | Kv |
| KEGA005TU Z-4/2018 | Building progressive machining of the CNC workplace for innovation of forms of teaching in study programs at FEMT | Štefan BarcíkPeter Koleda | KVAT | 2018-2020 | 7249 | 0 |
| KEGA 011TU Z-4/2017 | Support for thevalita of the teaching process in the fieldof Mechanics of bodies throughthe development of educational methods | Marian Minárik | KMSD | 2017 - 2019 | 3917 | 0 |
| KEGA011TU Z-4/2017 | Integration of progressive informationtechnologies and soft-skills into study programs focused on the management of production processes. | Helena Black | KVTMKv | 2017 - 2019 | 5731 | 0 |
| KEGA 008TUZ-4/2016 | New forms and methods of teaching in the field of machinery safety | Miroslav Dado | KVTMKv | 2016 -2018 | 4016 | 0 |
|
| KEGA 003TUZ-4/2016 | Research and teaching laboratory of robotics | Elena Pivarčiová | KVAT | 2016 - 2018 | 6225 | 0 |
|
| KEGA 001TUZ-4/2016 | Support for teaching heat and substance transfer in technical education | Jozef Černecký | CELT | 2016 - 2018 | 9998 | 0 |
|
| TOGETHER |   | 37136 | 0 |

**COMPLETED PROJECTS:**

**KEGA 008TUZ-4/2016 New forms and methods of teaching in the field of machinery safety**

**.doc. Ing. Miroslav Dado, PhD.**

Achievements:

In the course of solving the project, the research team created a comprehensive database of problem situations in the field of operation of machinery of forest mechanization, woodworking industry and agricultural technology. In order to obtain input data for the simulation model, options for monitoring wood dust emissions as a risk factor of the working environment in real time have been identified. The results of the comparison of educational results achieved in the pedagogical process through virtual reality and previously established ways of learning are part of the scientific monograph, which is the main output of the project. The created VR platform will be further used to increase the attractiveness and popularization of technical education.

 **KEGA 003TU Z-4/2016 Research and Teaching Laboratory of Robotics**

**.doc. Mgr. Elena Pivarčiová, PhD.**

Achievements:

* Construction of a robotics laboratory, including the necessary infrastructure (hardware and software support)
* Create a web portal: www.robohranie-proFEMT.wz.sk
* Actions aimed at popularizing science and technology among young people, which the investigator'steam carried out in the form of 18 popularization events in 2018:

Workshops for primary and secondary schools: 6

Robot competitions for children and youth 2

Presentationevents of the faculty at primary and secondary schools 2

Otherrobot presentations (fairs, exhibitions) 8

 Awards:

* Award of the Rector of the Technical University in Zvolen for popularization of science and research for the years 2017–2018 doc. Mgr. Elena Pivarčiová, PhD.
* Recognition by the Volkswagen Slovakia Foundation, inclusion of robo eventsPlay among the 10 most successful projects in the field of popularization of science and technology with a media campaign for the region of central Slovakia with the aim of presenting organizations to the general public – billboards, banners, citylights, Facebook; public presentation of projects in the Europa shopping center in Banská Bystrica

**KEGA 001TU Z-4/2016 Support of heat and substance transfer teaching in technical education.**

**Jozef Černecký, CSc. represented by Zuzana Brodnianska, PhD.**

Achievements:

The main result of the project is a university textbook entitled "Transfer of heat and substance", which consists not only of theoretical knowledge, but also incorporates the measurement methodology and the outputs of measurements on various experimental assemblies. According to the measurement procedures, students will be able to carry out their own measurements as part of the exercises or in the creation of final theses. Behind the theoretical parts of the chapters are given examples and tasks for independent solution by students. The university textbook will help to improve the teaching of subjects focused on the issue of heat and substance transfer at the Technical University in Zvolen. At the same time, it can also be helpful for other students of technical directions, researchers and the general professional public.

On the proposed and completed experimental assemblies in the field of heat and substance transfer, measurements were carried out and their results published in a foreign peer-reviewed journal and in four foreign journals registered in the Web of Science database, SCOPUS. The results were also presented at four foreign scientific conferences and in the form of two scientific papers in domestic journals. Among the original results can be included three proposed experimental assemblies, which have been registered as industrial utility models.

**PONGOING PROJECTS:**

**KEGA 011TU Z-4/2017 Integration of progressive information technologies and soft-skills into study programs focused on production process management.**

**doc. Helena Čierna, PhD.**

Achievements:

The results achieved in solving the KEGA project were presented by the members of the scientific team through their active participation in international scientific conferences at home and abroad. We consider the most important results achieved in solving the project in 2018 to be the publication of the scientific monograph *Determinants of safety culture in the conditions of Slovak enterprises* and the implementation of an international scientific colloquium, which resulted in the publication of a scientific peer-reviewed proceedings entitled *Ways and potential procedures for integrating progressive information technologies and soft - skills into production processes*.

**KEGA 001TU Z-4/2017 Support of the quality of the teaching process in the field of Body Mechanics through the development of educational methods**

**Ing. Marián Minárik, PhD.**

Achievements:

The main social benefit is determined by the theme itself and the objectives of the project: to support and improve the teaching of subjects related to the field of body mechanics and with the subsequent connection of teaching at the bachelor's and master's level of university studies.

Within the project solution, the achievement of results was fulfilled through the creation of a system and conceptual process of processing acquired information and its subsequent use in cross-subject relationships with an emphasis on the application of modern didactic means based on modern software and hardware products.

Through the implementation of subtasks that resulted in the fulfillment of the objectives of the solved project, both conceptual and material benefits arose (e.g. analysis of current forms of teaching and subsequent creation of the concept of the base of study materials, compilation of specific study materials based on the information found, creation of a website, reconstruction of the classroom spaces).

 **NEW KEGA PROJECTS:**

**KEGA 005TU Z-4/2018 Building a progressive machining CNC workplace for innovation of forms of teaching in study programs at the Faculty of Environmental and ProductionTechnicians**

**Prof. Štefan Barcík, CSc.**  **Since September 2019 Peter Koleda, PhD.**

Achievements:

* Introduction of a new subject programming of CNC production technology
* Elaborated and defended 2 bachelor's theses
* Elaboration of lectures and handouts for exercises from the subject programming of CNC production technology

### APVV projects (Agency for the Promotion of Research and Development)

In 2018, two projectsy APVV were also solved at the Faculty of Environmentand Production Technology.

**APVV 16-0194 Research on the impact of innovations in production processes on the durability of tools and components of forest mechanisms**

**doc. Ing. Richard Hnilica, PhD.**

Achievements:

In the second year, it was planned to continue processing FEM analyses of the voltage-deformation state of the instruments with the prediction of critical areas. This stage was completely fulfilled for working tools – teeth of forest cutters. The analyses for the selected additional components of forest mechanisms continued in 2018, namely pulleys and branch knives. Analyses are also carried out today, which is based on the requirements and progress of successive work. Input analyses of the materials of selected tools used in forest cutters, cutting knives used on harvester (processor) heads and pulleys used in the approach of wood were carried out. Specifically, it was optical and electron microscopy to determine the state of the microstructure, evaluate selected mechanical properties and test the wear resistance of materials with free abrasive particles. During the second stage of the solution, assessments of the mechanical properties of the materials of tools and components were carried out. Based on the results, appropriate methods and procedures were selected to increase the wear resistance of tools and components.

**APVV-17-0400** Strengthening the ethical environment in Slovakia (institutional processes, actors, risks, strategies)

**doc. Helena Čierny, PhD.**

Achievements:

In 2018, the research task was the creation of evaluation mechanisms of the ethical credibility of subjects and the analysis of ethical risks to promote ethically demanded or good practice. Practical activities were focused on the creation of ethical support projects, such as the creation of methodology and ratings of ethical assessment, as well as the formation of a specialized entity for consultative assistance in the institutionalization of ethics.

**Table 6.3** APVV project allocations in 2018 (in EUR)

|  |
| --- |
| APVV PROJECTS |
| PROJECT NO | PROJECT NAME | PROJECT LEADER | DEPARTMENT | TIME | ALLOTTED |
| SOLUTIONS | Bv | Kv |
| APVV 16-0194 | Research on the impact of production process innovations on the durability of tools and components of forest mechanisms | Richard Hnilica | KVTMKv | 2017 - 2020 | 58283 | 0 |
|
| APVV 17-0400 | Strengthening the ethical environment in Slovakia (ininstitutionalpractices, actors, risks, strategies) | Čierna Helena | KVTMKv | 2018-2021 | 1672 | 0 |
| Together |   | 59955 | 0 |

Staff of FEMT **doc. Richard Hnilica, PhD**. , **doc. Ing. Miroslav Dado, PhD., Jaroslav Matej, PhD., Stanislav Kvočka, ArtD.** participated in the solution of 1 APVV project at the Faculty of Forestry.

**APVV-14-0468** Adapter development and technological deployment to increase forest fire extinguishing efficiency

**Prof. Valéria Messingerová, CSc.**

Achievements:

During the fourth year of the project, the technical drawing documentation of structural elements for carrying material means, as part of the fire superstructure, continued to be drawn up. The addition of the above structural part will increase the versatility of the superstructure by making it a full-fledged superstructure in the extinguishing of forest fires. Operational and functional tests continued throughout the year. As a result of the tests, it was necessary to make certain modifications to the superstructure in order to meet the requirements arising from the environment where it will be deployed and the purpose of its use. Part of the project solution was also the ideological design of an adapter for transporting firefighting equipment in difficult terrain. The stated objectives of the project have been met in such a way that operational tests of the fire extinguisher can be continued, on the basis of which the definition of technological procedures for the destruction of fires in forests will be proceeded with. For this reason, the possibility of extending the project until July 2019 was requested.

Staff and PhD students (Prof. Štefan Barcík, CSc. and Michal Korčok) from the Department of KVAT participate in the solution of the APVV project at DF.

APVV-0456 **Thermal modification of wood with saturated water vapor in order to purposefully and steadily change the color of the wood mass.**

 **Ladislav Dzurenda, PhD.**

## Institutional research

For institutional research, the Faculty of Environmental and Production Technology was allocated EUR 6573,- which was used for the main activity of the faculty.

## Internal Project Agency Projects

 In 2018, **2** projects funded by the Internal Project Agency TU in Zvolen were solved at FEMT.

**Table 6.4** Allocations for IPA projects in 2018 (in EUR)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| PROJECT NO | PROJECT NAME | PROJECT LEADER | DEPARTMENT | BV ASSIGNED |
|
| IPA No 13/2017 | Research on chipless wood cutting using sector knives.  | Ján Melicherčík | CELT | 922 |
| IPA No 11/2018 | Multiparametric diagnostics of production machines in technical practice | Silvia Kopčanová | KMSD | 833 |
| TOGETHER |  | 1755 |

**IPA No. 13/2017 - Research on chipless wood cutting using sectoral knives.**

**Ján Melicherčík - PhD student**

Achievements:

Purchase of components for the functionality of the experimental stend, service of the pneumatic cylinder, production of preparations for attaching branch knives.

**IPA No. 11/2018 Multiparametric diagnostics of production machines in technical practice**

**Silvia Kopčanová**

Achievements:

To achieve results, a strain gauge force sensor was purchased along with an electronic transducer that measures the load rate of the bearing. For the interpretation of the load, a digital multimeter was purchased.

# Student scientific professional activity

The 18th faculty conference of ŠVOČ FEMT took place in the academic year 2017/2018 on 15.5.2018. The conference was divided into 3 sections. The first section was the Ecotechnics section, the second was the Production Technology section and the third was the Secondary Schools section. In total, 30 students participated in the faculty conference of ŠVOČ. The number of works is shown in Table 7.1. Table 7.2 shows the number of competitors by high school.

**Organizing Committee of the ŠVOČ:**

Prof. Štefan Barcík, CSc.Vice-Dean for Science, Research and Doctoral Studies

Marián Minárik, PhD.Chairman of the Board of ŠVOČ

Zuzana Brodnianská, PhD.member of the board of ŠVOČ

Peter Koleda, PhD.member of the board of ŠVOČ

Emil Škultéty Member of the Board of ŠVOČ

**Evaluation committees:**

*Ecotechnics section*

Prof. Jozef Víglaský, CSc.Chairman of the Commission

Milan Helexa, PhD.member of the Commission

Zuzana Brodnianska, PhD.member of the commission

Pavol Koleda, PhD.member of the commission

Ján Melicherčík Student Representative

*Section Production Technology*

Prof. Štefan Barcík, CSc.Chairman of the Commission

doc. Pavel Beňo, PhD.member of the Commission

doc. Jozef Krilek, PhD.member of the Commission

Mária Vargovská, PhD.member of the Commission

Michal Korčok Student Representative

*Secondary schools* section

Prof. Marián Kučera, PhD.Chairman of the Commission

doc. Ján Kováč, PhD.member of the Commission

Mgr. Miroslav Chamula Member of the Commission

Ján Melich Member of the Commission

Silvia Kopčanová student representative

**Table 7.1** Number of works by year

|  |  |
| --- | --- |
| SECTION | VINTAGE |
| 1. | 2. | 3. | 4. | 1. | 2. |
| Bachelor's degree (I. degree) | engineering (level II) |
| Ecotechnics |  |  | 1 |  |  | 7 |
| Production technology |  |  | 1 |  |  | 8 |
| Secondary schools | 13 |
| TOGETHER | presented works 30 |

**Table 7.2** Number of competitors in the Secondary schools section by secondary school

|  |  |
| --- | --- |
| High school | Number of students |
| Technical Academy, Zvolen | 4 |
| Private secondary technical school, Žiar nad Hronom | 3 |
| Secondary Industrial School, Levice | 4 |
| United School, Detva | 1 |
| Secondary Industrial School of Transport, Zvolen | 1 |
| TOGETHER | 13 |

**Evaluation of the tenders:**

When evaluating the competition works, the topicality of the topic, the objectivity of the execution of experimental works (if any), the level of evaluation of one's own conclusions, the formal level of the work as well as the level of presentation itself were taken into account. The submitted competition works were at a good level from a professional point of view. Minor shortcomings were in the area of the level of presentation itself and the formal editing of the works.

The participants were awarded the diplomas for placement according to the statement of the evaluation committee. The diplomas were handed over by the dean of the FEMT TU in Zvolen doc. Marián Kučera, PhD. and Chairman of the Board of ŠVOČ Marián Minárik, PhD., together with the relevant chairmen of the commissions:Mr. Štefan Barcík, CSc. and Prof. Jozef Víglaský, CSc. In the secondary schools section,an Honorable Mention was awarded to a selected participant of the ŠVOČ, who was rewarded with a material prize.

# DOCTORAL STUDIES

Doctoral studies at the faculty took place in the academic year 2017/2018 in one study programme within the meaning of Act No. 131/2002 on Higher Education Institutions.

**Table 8.1** PhD programme at FEMT

|  |  |  |
| --- | --- | --- |
| Code | FIELD OF STUDY | STUDY PROGRAMME |
| 5.2.50 | Production Engineering | Production Engineering |

## 5.2.50 Production Engineering

List of trade union commission members in 2018

**Chairman OK 5.2.50**

Prof. Štefan Barcík, CSc. FEMT TU in Zvolen

**MEMBERS OK 5.2.50**

|  |  |
| --- | --- |
| doc. Ing. Pavel Beňo, PhD. | FEMT TU in Zvolen |
| doc. Ing. Ferdinand Bodnár, CSc. | FEMT TU in Zvolen |
| Dr.h.c. prof. Ing. Pavol Božek, CSc. | MTF Trnava STU Bratislava, |
| doc. Ing. Miroslav Dado, PhD. | FEMT TU in Zvolen |
| Prof. Peter Demeč, CSc. | Faculty of Mechanical Engineering tu Košice |
| doc. Ing. Jiří Fries, Ph.D. | Faculty of Mechanical Engineering VŠB-TU Ostrava |
| doc. Ing. Richard Hnilica, PhD. | FEMT TU in Zvolen |
| doc. Ing. Ľubomír Javorek, CSc. | FEMT TU in Zvolen |
| doc. Ing. Ján Kováč, PhD. | FEMT TU in Zvolen |
| doc. Ing. Jozef Krilek, PhD. | FEMT TU in Zvolen |
| doc. Ing. Marián Kučera, PhD. | FEMT TU in Zvolen |
| doc. Ing. Ľubomír Naščák, CSc. | FEMT TU in Zvolen |
| doc. Mgr. Elena Pivarčiová, PhD. | FEMT TU in Zvolen |
| Prof. Mikuláš Siklienka, PhD. | DF TU in Zvolen |
| doc. Ing. Ján Svoreň, CSc. | FEMT TU in Zvolen |
| Prof. Jozef Víglaský, CSc. | FEMT TU in Zvolen |

**Study programme under the responsibility of the trade union committee:**

Production technology

**Headquarters of the trade union commission:**

Faculty of Environmental and Production Technology

Technical University of Zvolen

Student 26, 960 53 Zvolen

In the past year (as of 31.12.2018), 3 phD students successfully passed the dissertation exam in full-time form and 1 student in the part-time form of doctoral studies.

**Table 8.2** Successfully passed dissertation exams in 2018

(as at 31.12.2018)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| DEPARTMENT | NAME | TRAINER | BRANCH | DATE | THEME |
| KVAT | Ing. Zuzana Jamberová | Prof. Ing. Štefan Barcík, CSc. | Production Engineering | 5.10.2018 | Analysis of factors affecting energy indicators in the machining of thermally modified oak wood |
| KVTMKv | Ing. Veronika Ľuptáčiková | doc. Ing. Richard Hnilica, PhD. | Production Engineering | 1.6.2018 | Research on the durability of working tools of mechanisms used in the establishment of forests and the education of forest cover |
| KVTMKv | Ing. Lucia Mikušová | doc. Ing. Miroslav Dado, PhD. | Production Engineering | 13.4.2018 | Research on the process of generating a solid aerosol when grinding wood with electric hand tools |
| KVAT | Ing. Emil Škultéty | doc. Mgr. Elena Pivarčiová, PhD. | Production Engineering | 1.6.2018 | Analysis of the control of an autonomous robot using an inertial navigation system |

The dissertation was successfully defended by4 interní doctoral studentsand 2 external phD students.

**Table 8.3** Successfully conducted dissertation defenses in 2018

(as at 31.12.2018)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| DEPARTMENT | NAME | TRAINER | BRANCH | DATE | THEME |
| KELT | Ing. Tomáš Kuvik, PhD. | doc. Ing. Jozef Krilek, PhD. | Production technology | 28.8.2018 | Research on chainsaw cutting mechanisms |
| KVAT | Ing. Andrej Mazáň, PhD. | Prof. Ing. Štefan Barcík, CSc. | Production technology | 27.8.2018 | Determination of the methodology and creation of a mathematical model for the design of a lumber sorting device |
| KVAT | Nadežda Pondušová, PhD. | doc. Ing. Ľubomír Naščák, CSc. | Production technology | 9.2.2018 | Analysis of selected parameters of a mobile photovoltaic cell |
| KELT | Ing. Milan Štefánek, PhD. | doc. Ing. Ján Kováč, PhD. | Production technology | 28.8.2018 | Research on the effect of coating saw blades on their energy intensity |
| KVAT | Ing. Marek Vančo, PhD. | Prof. Ing. Štefan Barcík, CSc. | Production technology | 28.8.2018 | Analysis of factors influencing the qualitative indicators of the machining of thermally modified oak wood in plane milling |
| KVAT | Ing. Ján Zákopčan, PhD. | doc. Ing. Ľubomír Javorek, CSc. | Production technology | 27.8.2018 | Influence of drilling design on the quality of drilled holes and energy parameters of drilling metallic materials |

# CONCLUSION

The submitted Report on Scientific Research Activities (SCC) summarizes the results of the SCC and provides basic information about the personnel, technical and financial provision of the faculty's scientific and research work.

The focus of scientific and research activities is in accordance with the professional profiling of the faculty. The scope and effectiveness of SCC is largely determined by external conditions, in particular the lack of financial resources, which, among other things, directly affect the construction of laboratories and their equipment with the necessary technology. It is important that the initiative of the faculty staff is aimed at obtaining grants, projects and other activities to provide financial resources for scientific research activities.

Increased attention in this regard must be paid to cooperation with practice and the commercial exploitation of the results of scientific researchactivities. In this area, scientific and research activity at the faculty is not at the required level compared to previous years.

#  DRAFT MEASURES FOR 2019

Startingfrom the Long-Term Development Plan of FEMT for 2017-2023, the draft measures in scientificresearch activities are mainly focused on:

1. To maintain the position of the faculty in the scientific community and to develop the research character of the faculty by involving all creative faculty employees in solving domestic and international research projects, especially in the main directions of research.

**Responsible:** dean, vice-dean for VVČ, head of departments

 Timeframe: continuous

1. In the field of the structure of scientific research projects, focus on basic and applied research projects in order to achieve a balanced structure of funding of scientific research activities from all available sources. These are Slovak grant agencies (EU framework programmes, cross-border cooperation projects,the research and development agency of the Ministry of Education of the Slovak Republic for EU Structural Funds or international projects H2020) with maximum use of the activities atthe newly conceived FEMT Project Office.

**Responsible:** Dean, Vice-Dean for VVČ and ZS, Head of Departments

 Timeframe: continuous

1. In the field of presentation of the results of scientific and research activities of the faculty, focus on increasing the quality and frequency of published outputs. Focus especially on the preferred categories, which are the main ones in the faculty's subsidy, evaluation and project processes (priority of the faculty registered with the highest possible IF and the lowest quartile and A1, A2 registered in WoS). Increasing the CI according to WOS/Scopus and obtaining the attributes of awards of top international quality in the field of technical research.

 **Responsible:** dean, vice-dean for VVČ, head of departments, all creative employees

 Timeframe: continuous

1. To combine the research capacities of departments into larger projects with regard to the complex use of the laboratory and instrumental potential of the faculty.

**Responsible:** Dean, Vice-Dean for VVČ, Head of Departments

 Timeframe: continuous

1. Maintain and deepen cooperation with domestic and foreign research and production institutions in order to improve the quality of research results and their commercial use.

**Responsible:** Dean, Vice-Dean for VVČ and ZS, Head of Departments

 Timeframe: continuous

1. Use all available means to improve the image of the faculty in professional circles and the public by presenting the results of scientific research activities.

**Responsible:** Dean, Vice-Dean for VVČ and ZS, Head of Departments

 Timeframe: continuous

1. In the field of building and expanding instrumentation, regularly contribute to the purchase of instruments and equipment from the means to solve projects. Use development projects and all other available options to improve the status quo.

**Responsible:** project leaders

 Timeframe: continuous

1. Continue to support the development of student scientific and professional activities and focus on improving the quality of the presented works. To promote ŠVOČ FEMT at other technical faculties andsecondary schoolsin Slovakia with similar professional profiling.

**Responsible:** Vice-Dean of the VVČ, Head of Departments, Chairman of the ŠVOČ

 Timeframe: continuous

1. To support the presentation of own scientific and research activities and the possibility of comparing it with the results of other workplaces by organizing international scientific events at the faculty.

**Responsible:** Vice-Dean of the VVČ, Head of Departments, Head of Projects

 Timeframe: continuous

1. Orientation of the publishing as well as citation activities of PhD students to improve its quality, especially focusing on the preferred categories, on the best possible fulfillment of the criteria for obtaining funds from the subsidy schedule, andalso for the need to meet the criteria of future evaluations of the faculty in the context of the Dean's Methodological Guidance "Rules and requirements for the doctoral study program of VT at FEMT TU in Zvolen ".

 **Responsible:** dean, vice-dean of the VVČ, head of departments, trainers

 Timeframe: continuous

1. Adopt **the "Methodological Guidance of the Dean of the Faculty"**, concerning FEMT executives in the VVČ aimed at increasing their activities in publishing and design activities.

 **Responsible:** Dean, Vice-Dean for VVČ, Head of Departments

**Timeframe:** 31.12.2019