S T A N D P O I N T

for participation in a competition for an academic position "Associate Professor"
in Professional field: 5.1 Mechanical Engineering
Scientific specialty: Cutting of materials and Cutting tools
Posted at DV: issue 40/31.05.2022
Applicant: ch. assist. prof. Dimka Kostadiova Vasileva, PhD
Member of the scientific jury: assoc. prof. Aleksandar Kirilov Ivanov, PhD

1. A general characteristic of the applicant's research and development activities

Minimum requirements for acquisition of AP "Associate Professor"

Group of indicators	Content	Minimum requirements for acquisition of academic position "Associate Professor"	Number of points of the applicant
А	Indicator 1	50	**50**
Б	Indicator 2	-	-
В	Indicator 3 or 4	100	**100**
Г	Sum of Indicators from 5 to 11	200	**257.65**
Д	Sum of Indicators from 12 to 15	50	**180**
Е	Sum of Indicators from 16 to 28	-	
Ж	Indicator 29	30	**440**

The presented by ch. assist. prof. Dimka Vasileva, PhD, are 20 publication materials for application in this procedure, including 1 monograph, 7 papers at international scientific conferences abroad, 2 papers at international conferences in Bulgaria, 4 articles in international scientific journals abroad and 6 articles in international scientific journals in Bulgaria.

The presented publications can be separated to the following two general directions:

- Metrology, standardization, methods and tools for quality control and quality management – 9 pcs.;
- Tools, regimes, technologies, methods, approaches, and equipment for mechanical processing of materials (including the monograph) – 11 pcs.

In my personal opinion, **the main importance** is the summary of scientific publications according to their place of publication, regardless of whether they are reports or articles:

- Scientific publications that are referenced and indexed in the databases with scientific information Scopus and Web of Science – **11** items, of which **2** items into **Q2** - [Б11] and [Б13], **1** pc. into **Q3** - [Б12], **2** pcs. into **Q4** - [Б6] and [Б7];
- Scientific publications in non-refereed journals with scientific review or in edited proceedings - **8** pcs.

In **3** publications and the monograph, ch. assist. prof. Dimka Vasileva, PhD, is the only author, in **3** of the joint publications she is the first author, in **8** – she is the second author and in the remaining publications ch. assist. prof. Dimka Vasileva, PhD is the third author or part of a larger team of authors.

Among the documents provided to me, directly related to the application ch. assist. prof. Dimka Vasileva, PhD are the monograph and **10** pcs. scientific publications (articles and reports).

Based on the submitted documents, I assess the candidate's Research & Development activities as sufficiently significant. During the years 2014 - 2021 ch. assistant professor Dimka Vasileva, PhD,

participated in **3** research and **2** educational projects. The candidate is currently working as a Production Manager in the company Technoimpex 68 EOOD.

As a result of the above, the candidate ch. assist. prof. Dimka Vasileva, PhD, **has met all the minimum national requirements** according to PPRASRB and the requirements of TU-Varna for holding the academic position "Associate Professor", as the points collected by her for groups of indicators **Г, Д and Ж** significantly exceed the required minimum values.

2. Assessment of the pedagogical preparation and activity of the applicant

The work of ch. assist. prof. Dr. Dimka Vasileva, PhD, as a university teacher and her pedagogical qualification I assess at the level required for the academic position "Associate Professor", as she is lecturing on the following academic disciplines for the bachelor's and master's degrees:

- CNC Programming;
- Cutting Tools;
- Cutting of Materials;
- Design of Technology Equipment;
- Machine Tools;
- CNC Machine Tools;
- CNC Systems Programming;
- Machine Tools and Automated Manufacturing Systems – Master's degrees;
- CNC Programming – Master's degrees;
- Computer design of Machine Tools – Master's degrees;
- Cutting of Materials and Cutting Tools – Master's degrees;
- CAM programming of Metal Working Tools and systems – Master's degrees.

Under the guidance of the candidate, **7** students defended their Bachelor's and Master's degrees theses, in addition she prepared reviews for **2** theses.

One teaching mobility under the Erasmus+ program. The purpose of the mobility has been lecturing.

The candidate has been appointed as a consultant for two currently active doctoral students enrolled in the department.

The documentation given to me confirms the candidate's participation in the compilation of curriculum for 9 disciplines.

I was also presented with a document confirming the candidate's contribution in providing students with practical activities in a practical environment outside TU-Varna.

Industrial implementations

For such I consider the methodology developed by the candidate for measuring devices selection according to the requirements of MSA - Measurement System Analysis, implemented in KOMAKS BULGARIA EOOD. As a result of this implementation in the production process, an increase in the quality of the production has been established and the company's losses from defective production have been significantly reduced.

3. Major scientific and applied science contributions.

I confirm the proposed scientific and applied contributions which can be referred to the following groups:

Scientific contributions - 4.

1. The proposed model describes the trajectory of the tip of the tool for evaluating the shape error in the cross-section of the workpiece during a step change in the cutting force during turning. [Б8]
2. An equations for the shape ratio coefficient and dimensions of the k-th harmonic have been proven and derived. With them, it is possible to choose the most suitable combination for the angle of the

prism and the direction of measurement, when measuring the deviation from roundness measured using prisms. [Б5]

3. Developed and proposed methodology for the analysis of the dynamic system through the frequency and time characteristics, zeros and poles of the system, calculated and graphically presented using Matlab. [Б9]

4. It is proven and theoretically justified that the developed by us tool for surface plastic deformation has the possibility to adjust the deforming force and to measure its value during the surface plastic deformation processing. [Б12]

Scientific applied contributions - 7.

5. An approach has been developed and proposed for using multivariate experimental analysis and determining the influence of the main parameters of the surface plastic deformation process on the fatigue resistance of the studied AISI 304 and 316L steels. [Б11]

6. An experimental study has been conducted and the applicability of the mathematical models for calculating the coordinates of the tool path point was confirmed. [Б12]

7. Mathematical models have been developed for the formation of uniform microreliefs by surface plastic deformation using a modern nonvibrating method. [Б12]

8. A theoretically justified approach for switching from one processing method to another method of processing of complex rotary surfaces is proposed. [Б7]

9. An algorithm for the selection of appropriate measuring tools and appropriate measurement methods has been developed. [Б1]

10. A new methodological sequence approach has been developed for fracture fatigue testing of different types of materials, processing methods and experimental plans involving a different number of influencing factors. [Б11]

11. It has been proved by experimental investigation that the stable operating ranges of a CoroMill 490-050Q22-08M milling head can be determined in terms of the value of the generated relative displacement during the face milling process. [Б13]

Applied contributions – 3.

12. The practical necessity of introducing the GPS standards in Bulgaria in Bulgarian language has been proven, aiming at the correct understanding and application of the new symbols, which would lead to their wide use in practice. [Б10]

13. An experimental test rig has been designed for the evaluation of the main axes of stability of a CNC lathe metal-cutting machine, which finds application in practice. [Б8]

14. An experimental test bench has been developed and implemented in the real practice to study the influence of parameters: cutting speed; feed rate, the actual number of cutting edges involved in the milling process; the minimum thickness of the cut material layer and their relative displacement in the tool-workpiece system relative to the roughness parameter of the processed surface Ra. [Б13]

4. Significance of contributions to science and practice.

The significant scientific, scientific-applied, and applied contributions enrich the theory, teaching material and practice in the field of the announced competition.

The information presented in Headings 1 and 3 speaks of the recognition of the candidate and gives reason to claim that the majority of the contributions are hers personal work or were obtained with hers decisive participation.

Citations

22 citations of papers are presented, such as: in Scopus and Web of Science - **17**, and the remaining **5** in peer-reviewed scientific journals/proceedings.

The citations speak of the recognition of the candidate by the scientific circles at home and abroad, and the presence of publications falling into **Q2**, **Q3** and **Q4** speaks in itself about the quality of scientific production.

The quantitative indicators of the criteria for holding of the academic position "Associate Professor" at TU-Varna have been met.

5. Critical remarks and recommendations.

It is noteworthy that, in addition to teaching and research work, the candidate performed a variety of administrative and organizational activities in the TMMM department and the University, work under contracts for joint cooperation between the department and business representatives, which is commendable.

I did not find any significant gaps, both of a principled and discursive nature, in the candidate's works.

Preliminary proposals and notes of a secondary nature have been submitted to candidate, which should be accepted as recommendations for her future work.

I recommend the candidate to focus on her scientific activity, since she already works not only as a university professor and young scientist, but also as a co-supervisor of doctoral students, and this nowadays requires considerable effort on the part of supervisors.

CONCLUSION

I do not know the candidate personally, however based on my acquaintance with the presented scientific works, their importance and the scientific, scientific-applied and applied contributions contained in them, **I find it reasonable to propose ch. assist. Prof. Dimka Kostadinova Vasileva, PhD, to acquire the academic position "Associate Professor"** in the professional field 5.1. Mechanical engineering, scientific specialty "Cutting of materials and cutting tools".

Заличена информация
по Регламент (ЕС)
2016/679

Date: 19.09.2022 **Jury member:**

Ruse **/Assoc. Prof. Aleksandar Ivanov, PhD/**