

REVIEW

for participation in a competition for an academic position "Associate Professor" in Scientific field 5. Technical Sciences, Professional field 5.1. Mechanical Engineering, Specialty "Cutting of materials and cutting tools", announced in SG No. 40 of 31.05.2022 and on the website of the Technical University - Varna.

with a candidate: Assist. Prof. Eng. Dimka Kostadinova Vasileva PhD

Reviewer: Prof. Eng. Vasil Stefanov Kostadinov DScTech

According to Rector's Order 559/25.07.2022 of the Technical University of Varna

1. General and biographical data

The participation in a competition was announced for the needs of the Department of "Technology of Machine Tools and Manufacturing". At the announced competition the documents were submitted by only one candidate - Assist. Professor Dimka Kostadinova Vasileva PhD.

Dimka Kostadinova Vasileva was born in Yambol in 1987. She graduated her education at TU-Varna in the specialty "Manufacturing Engineering and Technology". In 2018, he defended his doctoral thesis on the topic "Planning of quality inspection". She started her professional career at Palfinger Produktionstechnik Bulgaria Ltd. - Tenevo and continues at Technoimpex 68 Ltd. - Varna, where she holds the positions: Operator of CNC machines, Engineer Designer, Mechanical engineer, Production manager. Since 2019 to this day, she is an Assist. Professor at the Technical university of Varna, in the Department of "Technology of Machine Tools and Manufacturing", Faculty of Manufacturing Engineering and Technologies.

2. General description of the submitted materials

The applicant has submitted to the following works for the following works:

2.1. Independent monograph, entitled "Choosing Effective Methods and Means for Part Processing by Cutting" - [A1].

The monograph is 113 pages. It was published by "Color Print" Varna in 2022, with ISBN 978-954-760-547-3 and it was reviewed by Prof. Dimitar Damyanov Damyanovski PhD and Assoc. Prof. Dimitar Nedelchev Nedelchev PhD.

2.2. Scientific publications - 19 pcs.

The scientific publications presented in the competition can be presented as follows:

- Scientific papers present at international scientific conferences abroad [B1], [B2], [B3], [B4], [B5], [B6], [B7] - 7 pcs;
- Scientific papers present at international conferences in Bulgaria [B8], [B9] - 2 pieces;
- Scientific publications in international scientific journals abroad [B10], [B12], [B13] - 4 pieces;

- Scientific publications in international scientific journals in Bulgaria [B14], [B15], [B16], [B17], [B18], [B19] - 6 pieces;
 - ❖ Scientific publications referred to and indexed in world - renowned scientific databases are 11 - [B1], [B2], [B3], [B4], [B5], [B6], [B7], [B10], [B11], [B12], [B13];
 - ❖ Scientific publications in unreferred journals with scientific peer review or in edited collective papers are 8 pcs. - [B8], [B9], [B14], [B15], [B16], [B17], [B18], [B19];
- 2.3. Scientific publications on the dissertation - 5 pcs. [B1], [b2], [b3], [b4], [b5].

The total number of works with which the applicant participates in the competition is 24.

I do not accept for review 6 labor for the following reasons:

- Monograph referred to in point 2.1 – 1 pc.;
- Scientific publications referred to in point 2.3 I report, but I do not review - 5 pieces;

I accept 19 labor for reviewing. The applicant's participation in the peer-reviewed papers is as follows:

- an independent author is in 3 labor [B15], [B17], [B18];
- The first author is in 3 works [B6], [B7], [B9];
- The second author is in 8 works [B1], [B4], [B5], [B8], [B10], [B14], [B16], [B19];
- The third author is in 2 works [B2], [B3];
- The fourth author is in 1 work [B11];
- The fifth author is in 2 works [B12], [B13].

Of the publications presented in the competition, there are 5 pieces in Bulgarian language, and in English language there are 14 pieces. The scientific publications on the topic of the competition are 10 pcs.

3. General characteristics of the research and scientific applications activity of the applicant.

Thematically, the publications of Assist. Professor Eng. Dimka Kostadinova Vasileva PhD can be systematized in the following two areas:

- Quality inspection methods and devices - [B1], [B2], [B3], [B4], [B5], [B10], [B14], [B15], [B16];
- Methods and tools for part processing - [B6], [B7], [B8] [B9], [B11], [B12] [B13]], [B17], [B18], [B19];

The candidate also demonstrates significant research and development activity. As can be seen from the attached reference (14-6), the applicant took part in 6 projects in the period 2019-2022, of which 3 pcs. are scientific research projects and 3 pcs. Are educational projects.

An author's reference for applied in practice results of the candidate's scientific research is presented.

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

The applicant's pedagogical qualification and her work as a teacher I appreciate the as a level of the requested scientific title "Assistant Professor", as she lectures on the following subjects on the Bachelor's and Master's degrees:

- Computer programming of CNC machines;
- Cutting tools;
- Cutting of materials;
- Design of Technical equipment;
- Machine tools;
- Machine tools and automated manufacturing systems;
- Computer design of machine tools;
- Cutting of materials and cutting tools
- CNC Programming of machine tools and systems with CAM.

The candidate participated as a lecturer at the Technical University of Yash - Georgi Assachi, Romania with Erasmus+ Teaching Mobility.

Under her leadership, 7 graduates have been defended and the works of 2 graduates have been reviewed. She works as a consultant for two PhD students enrolled in the Department of "Technology of Machine Tools and Manufacturing" in TU-Varna. She has worked as a mentor in conducting practical training of 5 students from the Technical University - Varna under the Student Practices project - Phase 1. She has participated as a mentor and in conducting practical training in the production environment of two foreign students from the Thracian University in Edirne, Turkey and Technical University of Karadeniz in Trabzon, Turkey.

5. Major scientific and applied science contributions

The applicant's works contained in the works of the applicant can be referred to the following groups:

5.1. Scientific contributions (Creation of new classifications, research methods, new constructions and technologies)

- A model has been created describing the trajectory of the tip of the tool when a jumping change in cutting force on turn allowing the evaluation of the error of the form in the cross -section of the workpiece. [B8]

- Equations for the ratio of the shape and dimensions of K harmonic are derived when measuring the deviation from circularity to prisms. It allows to choose the most appropriate combination for the angle of the prism and the direction of measurement. [B5]

- A methodology for analyzing the vibration resistance of the dynamic system of the machine tool is proposed through the frequency and time and characteristics. They are calculated and graphically depicted using Matlab. [B9]

5.2. Scientific contributions (Obtaining and proving new facts and creating new classifications, methods, structures, technologies, schemes).

- An approach is proposed to use a multi - phactor analysis to determine the influence of the basic parameters of the surface plastic deformation mode (SPD) on the resistance to fatigue of the studied steel AISI 304 and 316L. [B11]
- Mathematical models have been developed for the formation of regular micro - reliefs through surface plastic deformation (SPD). [B12]
- A theoretically justified approach is proposed to change from one method of processing to another method of technological processing of complex rotary surfaces. [B7]
- An algorithm has been developed to select the appropriate measuring instruments and measurement methods. [B1]
- A new approach to a methodological sequence for the testing of fatigue in the destruction of different types of materials, processing methods and experimental plans has been selected. [B11]

5.3. Applied contributions

- The practical need for the introduction of GPS standards in Bulgaria has been proven, aimed at properly understanding and applying new symbols, which will lead to their widespread use in practice. [B10]
- An experimental stand has been constructed to evaluate the main axes of stability of the SP-503 lathe with CNC. [B8]
- Experimental examination has been proven to determine the stable working ranges of the Coromill 490-050Q22-08M milling headlines regarding the value of the relative displacement during the front milling process. [B13]
- An experimental unit has been implemented to examine the influence of cutting and feed rate, the actual number of cutting edges and the minimum thickness of the cut material on the parameter of the roughness Ra of the treated surface. [B13]

5.4. Citations

19 citations are presented, distributed as follows:

- In scientific publications, referred or indexed in a world - renowned database with scientific information or in monographs and collective volumes - 17 pcs. [B1], [B2], [B3], [B4], [B10], [B11];
- In unrefused magazines with scientific review - 2 pcs. [B1], [B3];

6. Significance of contributions for science and practice.

There are significant scientific, scientific and applied contributions. They enrich the theory, learning material and practice in the field of the announced competition for "cutting of materials and cutting tools".

A significant volume of the methodical and analytical part of his scientific activity is also implemented in the learning process.

The information set out in points 2 and 3 gives reason to claim that in their prevailing part of the contributions are her personal work or were obtained in her decisive participation.

The quotations referred to in point 5.4 indicate the recognition of the candidate from the scientific circles in Bulgaria and abroad.

The quantitative indicators of the criteria for the occupation of the academic position "Associate Professor" were met. Groups Г, Д and Ж are overflowing.

There is no evidence of an economic effect obtained.

7. Critical remarks and recommendations

In the works of the candidate, I did not find omissions of a principled or debatable nature - such as literary ignorance, wrong statements, incorrect methodology, incomplete analysis or incorrect summary of the results. When the candidate publishing future works, it is necessary, the conclusions and contributions to them must be more specific and precise. They have a place of secondary notes, which should be accepted as recommendations for the work of the applicant and the future team of assistants and PhD students. They were handed over to her in advance.

8. Personal impressions and opinion

I personally know the candidate Assist. Professor Eng. Dimka Kostadinova Vasileva PhD, as I was a reviewer in her PhD thesis. I believe that she is a qualified specialist and can be characterized as a recognized researcher and educator in the field of technology of mechanical engineering.

Assist. Professor Eng. Dimka Kostadinova Vasileva PhD continues to improve her qualification through various specializations, as well as performs various social activities, detailed in Annexes 14-10, 14-11 and 15.

Conclusion

Based on my introduction to the scientific works presented, their importance and the scientific, scientific and applied contributions contained in them, I find it justified to give my positive assessment and to propose the scientific jury to prepare a report-proposal to the Faculty Council of the Faculty of Manufacturing Engineering and Technologies to choose an Assist. Professor Eng. Dimka Kostadinova Vasileva PhD at the academic position "Associate Professor" at the Technical University - Varna in the professional field: 5.1. Mechanical engineering, scientific specialty "Cutting of materials and cutting tools".

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Reviewe
/Prof. Vasil Kostadinov DScTech/