

OPINION

according to a competition for the academic position
of "Associate Professor" in
scientific field 5. Technical sciences
by professional direction 5.1. Mechanical Engineering
scientific specialty "Cutting of materials and cutting tools" at the "TMMM"
department of MTF in TU-Varna, announced in State Gazette No. 40 of
31.05.2022.
with candidate: chap. assistant, Ph.D. Eng. Dimka Kostadinova Vasileva

Member of the scientific jury: Assoc. Prof. Dr. Eng. Tanya Petkova
Grozeva (according to Order No. 559/25.07.2022 of the Rector of TU –
Varna)

1. General characteristics of the candidate's research and applied scientific activity

The candidate in the announced competition, Dimka Vasileva, completed her secondary education at PTG "Ivan Raynov" - the city of Yambol, majoring in "Technologist-programmer of CPU systems". Graduated from TU Varna, majoring in "Mechanical engineering and technology" in 2010. He graduated as a Master in the same specialty - "Mechanical Engineering and Technologies" in 2012. In 2018 acquires ONS Doctor, with scientific specialty 02.01.10 "Technology of mechanical engineering".

In 2005 started his first job at Palfinger Produktionstechnik Bulgaria EOOD - village of Tenevo, and since 2011 works in the company Technoimpex 68 EOOD. The positions he holds in the companies are: Machine operator metal cutting machines, Designer, Design engineer, Mechanical engineer, Production manager.

During the period 2019-2022. holds the academic position of "principal assistant" at TU-Varna, Department of Mechanical Engineering and Metal Cutting Machines.

The candidate fulfills the minimum national requirements for an associate professor for all groups of indicators, respectively:

Group A, indicator 1 – 50 points (out of a minimum of 50);

Group B, indicator 3 or 4 – 100 points (out of a minimum of 100);

Group D, indicators 7 and 8 – 257.65 points (out of a minimum of 200);

Group D, indicators 12 and 14 – 180 points (from a minimum of 50);

Group E – 0 points;

Group G, indicator 29 – 440 (for 3 years) (from a minimum of 30 tons per year)

From the summaries of the scientific works, it is clear that the author focused on consideration and research in the following areas:

- Methods and means of quality control;
- Methods and tools for mechanical processing.

In the first area, he worked on the preparation of the dissertation and in the period 2012-2018.

After 2019, she turns to the second area, where she writes a monograph, and in 2021 and 2022, her main publications are there.

2. Evaluation of the candidate's pedagogical training and activity

The candidate's educational and pedagogical activity is within 3 (three) academic years 2019/2020, 2020/2021 and 2021/2022, but it is rich and varied.

A set of lectures read by disciplines in both the Bachelor's and Master's programs is indicated:

- Computer programming of machines with digital - program control
- Designing a product in a team
- Cutting tools
- Cutting the materials
- Technological equipment. design
- Information technologies and systems
- Metal cutting machines
- Programming of CNC machines
- 3D modeling
- Computer programming of machines and systems with digital program control
- Information technologies and systems
- Metal cutting machines and automated production systems
- Programming of material processing machines and systems with CAM, etc.

Auditory learning activity consists of 440.4 hours of lectures, 0 hours of seminar exercises, 685.1 hours of laboratory exercises and 142.7 hours of course work/course project, and extra-auditory learning activity is 133.6 hours.

She supervised 7 diploma students, reviewed 2 diploma theses and is currently the co-supervisor of two doctoral students.

A reference is also visible for contribution in creating partnership relationships with business to support the learning process.

The companies with which there are signed contracts are mainly those where Ms. Vasileva worked:

- Technoimpex 68 EOOD - city of Varna
- PALFINGER PRODUCTION TECHNICIAN BULGARIA LTD - Tenevo village branch
- VSK CENTAVER - IZ DINAMIKA OOD - town of Dryanovo.

From the materials provided to the author, it is evident participation in 3

educational projects, as well as teaching mobility with the aim of teaching within the framework of the Erasmus+ program 2021/2022 at the "Gheorghe Asachi" Technical University of Iasi, Romania, 2022.

3. Basic scientific and applied scientific contributions

The main contributions of the author can be directed and formulated as the creation of new classifications, research methods, new constructions and technologies and grouped by groups as follows:

A) Scientific

1. A model describing the trajectory of the tip of the tool is proposed for estimating the shape error in the cross-section of the workpiece during a sudden change in the cutting force during turning. [B8]

2. Equations for the ratio coefficient of the shape 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 in prisms. [B5]

3. A methodology was developed and proposed for the analysis of the dynamic system through the frequency and time characteristics, zeros and poles of the system, calculated and graphically displayed using Matlab. [B9]

4. It is proven and theoretically justified that the instrument for surface plastic deformation (SDP) developed by us has the possibility to adjust the deforming force and to measure its size during the SDP processing process. [B12]

B) Scientific - applied contributions

5. An approach has been developed and proposed for using factorial experimental analysis and determining the influence of the main parameters of the PPD process mode on the fatigue resistance of the studied AISI 304 and 316L steels. [B11]

6. An experimental study was conducted and the applicability of the mathematical models for calculating the coordinates of the tool path point was confirmed. [B12]

7. Mathematical models have been developed for the formation of regular microreliefs through surface plastic deformation (SDP) and the use of a modern vibration-free method. [B12]

8. A theoretically grounded approach is proposed for switching from one processing method to another method of technological processing of complex rotary surfaces. [B7]

9. An algorithm has been developed for the selection of appropriate measuring tools and measurement methods. [B1]

10. A new methodological sequence approach has been developed for fracture fatigue testing of different types of materials, processing methods and experimental designs involving a different number of influencing factors. [B11]

11. It has been shown 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 relative displacement generated during the face milling process. [B13]

C) Applied Contributions

12. The practical necessity of introducing the GPS standards in Bulgaria in the 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. [B10]

13. An experimental bench was constructed for evaluating the main axes of stability of a CNC lathe metal-cutting machine, which finds application in practice. [B8]

14. An experimental setup was developed and implemented in practice to study the influence of the parameters: cutting speed; feed rate, the actual number of cutting edges involved in the milling process; the minimum thickness of the sheared layer of material and their relative displacement in the tool workpiece system relative to the roughness parameter of the processed surface Ra. [B13]

Of the mentioned reports in international conferences abroad - 7 issues, Mrs. Vasileva participated with two (4 issues) and with one co-author (3 issues)

From Reports from International Conferences in Bulgaria - 2 issues, the co-author is one.

There are 4 articles in international scientific journals abroad, with a minimum of two co-authors.

There are 6 articles in international scientific journals in Bulgaria, of which 3 are independent.

I notice a clearly expressed style of exposition in the documents prepared by the candidate for the competition and especially in the reference for scientific and scientific-applied contributions. They are in scientific language, with clear and precisely expressed statements and positions.

From the summary of the monograph [A1] it is clear that it is aimed at choosing effective methods and means for processing the details by cutting.

22 citations of works in Google Scholar, Scopus and WOS are presented in the candidate's materials.

From the materials provided, the author's participation in 3 research projects is evident.

4. Significance of contributions to science and practice

Thematically, the author's works can be systematized in the following two areas:

- Quality control methods and tools - [B1], [B2], [B3], [B4], [B5], [B10], [B14], [B15], [B16];

- Methods and tools for mechanical processing - [B6], [B7], [B8] [B9], [B11], [B12] [B13], [B17], [B18], [B19].

The quantitative indicators of the criteria for occupying the academic position "associate professor" have been met.

The significance of the contributions can be summarized according to the publications as follows:

Scientific contributions - in publications [B5], [B8] [B9], [B12]

Scientific and applied - in publications [B11], [B12]

Applied – in publications [B8], [B10], [B13].

The citation of a large part of the publications speaks of the candidate's recognition among the scientific circles at home and abroad.

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

5. Critical notes and recommendations

I have no fundamental and formal objections to the candidate's scientific works, as well as to his teaching work.

Unfortunately, there is still no participation of Mrs. Vasileva in teaching aids and supplies, and her extensive practical experience would be very useful in educational literature.

CONCLUSION

Based on the acquaintance with the presented scientific works, their importance, the scientific, scientific and applied contributions contained in them, I find it reasonable to propose: Ch. Dimka Kostadinova Vasileva, assistant professor, Ph.D., to take the academic position of "associate professor" in the professional direction 5.1. Mechanical engineering in the scientific specialty "Cutting of materials and cutting tools" at the "TMMM" department of MTF in TUVarna

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JURY MEMBER: .

(Ass.prof. I. Grozeva)