

OPINION

by competition for the occupation of an academic position "Docent"/"Professor" under PN 81/2007 for the position of Associate Professor in the specialty "Mechanical engineering, course "Programming machines and systems with CAM" for the position of Associate Professor in the specialty "Mechanical Engineering and Metal Cutting Machines" of the Technical University – Varna Announced in SG no. No. 67/04.08.2023 with candidate: Assoc. Dr. Eng. Stoyan Dimitrov Slavov

Member of the scientific jury: Prof. Dr. Eng. Dimcho Stoilkov Chakarski



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

Assoc. Dr. Stoyan Slavov was born on 01.10.1973. In 1998, he obtained a Master's degree in Mechanical Engineering Technology and Metal Cutting Machines. In 2004, he obtained the educational and scientific degree Doctor in the specialty "Technology of mechanical engineering and metal cutting machines". Dissertation topic: "Technological possibilities of vibrational surface plastic deformation for management of some quality parameters and operational characteristics of flat surfaces".

The candidate has the following work experience:

- From 2003 to 2005, "Flag Apex" Ltd., Sofia, "Macedonia" square № 1. Assistance in the preparation of organizations for successful certification according to international standards.
- From 2005 to 2006 "InterKIT Consult" EOOD, Varna, 23 "Dr. Basanovich" St., Apt. 48. Assistance in the preparation of organizations for successful certification according to international standards.
- From November 2006 to June 2012, Technical University - city of Varna, "Studentska" St. No. 1. Chief Assistant in Mechanical Engineering Technology.
- From July 2012 until now Associate Professor of Mechanical Engineering Technology at the Technical University - Varna.
- From June 2018 to March 2019, VID Head of the TMMM Department at the Technical University - Varna.
- From September 2016 to March 2019, Head of the Quality Center at the Technical University of Varna.
- From March 2021 to October 2022, Expert at the Center for Rating Analysis at the Technical University of Varna.
- From October 2022 until now. Head of the Accreditation Center at TU - Varna.

The candidate is the author and co-author of over 80 publications, about 20 of which are indexed in the world-famous SCOPUS and Web of Science databases.

The candidate submitted for review a total of 43 scientific papers and a list of 14 scientific research developments.

All submitted scientific works that are outside the dissertation and for the acquisition of the academic position of associate professor are accepted for the opinion, being taken into account in the final evaluation 14 research projects.

He has participated in a total of 14 project contracts under: TEMPUS, operational program "Human Resources Development", co-financed by the European Social Fund of the European Union, Scientific Research Fund at the Ministry of Education and Science and internal competitions at TU-Varna, financed by the state budget for science of R. Bulgaria He was the head of 8 of the projects.

The distribution of scientific works is as follows:

- Monograph – 1 pc.
- Scientific publications in publications that are referenced and indexed in world-renowned databases with scientific information - 11 nos.
- Scientific publications in non-refereed journals with scientific review or in edited collective volumes - 12 nos.

- Participation in a national scientific or educational project - 8 pcs. • Guide to a national scientific or educational project - 6 pcs.
- Published university textbook or of a textbook that is used in the school network - 2 pcs.
- Published university textbook or textbook that is used in the school network - 3 pcs.

The assessment of the candidate's scientific research and applied scientific activity is positive. A particularly good impression is made by the participation and management of scientific research projects and the numerous citations of scientific publications by Prof. Slavov.

2. Evaluation of the pedagogical preparation and activity of the candidate.

The candidate actively participates in the educational and pedagogical activity, leading lectures and exercises in various disciplines, including the course. 2 textbooks and 3 teaching aids have been published. He is the head of 53 graduates in cat. TMMM of TU-Varna. All have successfully defended the topics of the graduate theses. He is the scientific supervisor of four doctoral students, one of whom has successfully defended his PhD, and the other three are in the process of training.

3. Basic scientific and scientific-applied contributions.

The monograph is entitled "Formation of regular reliefs using CNC machines". The main objective of the monograph is to develop methodologies for forming PMP based on the PPD finishing process for different types of surfaces, using the kinematic capabilities of different types of CNC metal cutting machines. The influence of some of the regime parameters of the PPD on the resulting topographic characteristics of the PMP was investigated. The following activities were carried out:

- An overview and analysis of the existing methods, schemes and tools and specialized machinery for the implementation of the PPD and VPPD processes was carried out;
- Corresponding mathematical models have been derived and systematized, which allow calculation of suitable trajectories of the tip of the processing tool for forming PMP on cylindrical, conical, plane and non-plane surfaces having different contours, by means of PPD;
- Algorithms have been developed that ensure that the resulting tool trajectories are of the shortest possible length within the deformed area for the given type of surface;
- The possibilities and features of applying the PPD process for the formation of PMR using different types of CNC machines with different number of simultaneously controlled axes have been established;
- The direction of influence and the magnitude of the significance of the main influencing mode parameters of the PPD process, implemented on a CNC machine, on the topographic characteristics of PMR formed on flat surfaces were investigated. The monograph contains received scientific and scientifically applied contributions.

Scientific contributions

The following scientific contributions can be distinguished in scientific works:

- A concept is proposed to achieve the necessary complex planar and spatial trajectories of deforming tools to form different types of regular reliefs (RRs), through a surface plastic deformation (SDP) process using CNC machine tools on the surfaces of differently shaped parts and contour profile [B 3-1, D 7-2];
- A method of interpolation of the axes of the MM with CNC is proposed, which greatly simplifies the construction and dimensions of the tools for this type of operations and enables the finishing operation for PPD to be performed on the same machine immediately after the preceding forming operations [B 3- 1, D 7-2];
- On the basis of obtained mathematical models for calculating the coordinates of characteristic points of the trajectory of the deforming element, the possibility of automatically creating corresponding control programs for lathe, lathe milling and milling multi-axis machining centers with CNC for performing partial forming operations has been proven and completely regular reliefs through the PPD process,

suitable for processing details having different surfaces [B 3-1, D 7-2, D 7-4, D 7-5, D 8-2, D 8-9, etc.];

- Original approaches have been developed for automated identification of the number of cells of completely regular reliefs and determination of their topographical characteristics, based on standardized criteria, using parallel measured profilograms by the contact method and a combination of them and obtained digital images of PP by optical microscope [D 8-12B 3-1, D 7-9, D 7-11];
- A group of uncorrelated three-dimensional criteria has been identified, according to the ISO 25179-2 standard, describing the complex topographic characteristics of the RR obtained after PPD using CNC machines [B 3-1, D 8-7].

Scientific contributions refer to the groups

Formulation or justification of a new scientific field or problem; Creation of new approaches, classifications, methods; Obtaining corroborating facts.

Scientific - applied contributions. In the scientific works of the candidate, numerous scientifically applied contributions have been obtained. They concern the development and application of a number of mathematical models and algorithms for various types of tools and the direct generation of control programs for CNC machines.

Applied Contributions.

- On the basis of a review and analysis of existing designs of tools for vibration and smooth PPD, new, simpler and compact designs of tools for forming PP, intended for work with lathe and milling centers with CNC, have been created.
- Through experimental studies, the recommended values of the mode parameters of the PPD process have been established to obtain the maximum number of cycles to fatigue failure of austenitic steels, and the influence of the size of the deforming force and the feed rate during the PPD of aluminum samples made of aluminum alloy has been established.
- The results obtained in the scientific works of the candidate are used in the engineering practice and in the learning process of the students of the specialty of mechanical engineering technology and metal cutting machines. A number of methodological contributions have also been received, which are useful for the learning process with students.

4. Significance of contributions for science and practice.

Contributions in the candidate's scientific works are significant. They have met and significantly exceeded the quantitative indicators of the criteria for holding the academic position of professor (exceeding more than 3.5 times). The candidate is recognized among the scientific circles at home and abroad. The minimum national requirements are exceeded more than 3.5 times. The candidate submitted documents with a total of 2116.6 points, and the minimum requirements for the academic position of professor are 600. The number of citations of the candidate's scientific works is high - 20 nos. publications /77 times/.

- Citations in scientific publications, referenced and indexed in world-famous databases with scientific information or in monographs and collective volumes - 17 items. publications /61 times/.
- Citations in monographs and collective volumes with scientific review - 2 nos. publications /4 times/.
- Citations in non-refereed journals with scientific review – 3 nos. publications /12 times/.

In the scientific works of the candidate for the academic position of professor, the theory related to machines with digital program control and especially to the programming of these machines using CAM systems has been enriched. This is of great importance for increasing their productivity and efficiency.

The table shows the compliance with the minimum requirements of the competition and the candidate's points according to the individual criteria.

City. indicators	Minimum number of points	Number of points on the candidate
A	50	50
Б	-	-
B	100	100
Г	200	289.3
Д	100	514.5
Е	150	394.6
Ж	120	768.2
Total	600	2116.6

5. Critical notes and recommendations.

I have no fundamental objections to the candidate. All documents are precisely developed and presented.

- I have some formal remarks that do not diminish the merits of the presented scientific works.
- The statement of contributions is very consolidated.
- Not all posts end with contributions.
- There are also some outstanding technical bugs.

CONCLUSION

Based on my familiarity with the submitted materials for the competition, my personal impressions, the relevance and significance of the scientific and scientific-applied contributions contained in the developments, the achieved implementation in engineering practice, I convincingly recommend the respected scientific jury to positively evaluate the scientific works of the competition and fully it is reasonable to propose Assoc. Dr. Eng. Stoyan Dimitrov Slavov to occupy the academic position of Professor in professional direction 5.1 Mechanical Engineering, study discipline "Programming of machines and systems with CAM"

Date: 28/12/2023

JURY MI Заличена информация
/prof. по Регламент (ЕС)
2016/679