

# OPINION

by Assoc. Prof. Valentin Metodiev Petkov, PhD, Technical University of Gabrovo

on the materials submitted for participation in a competition for the occupation of the academic position “Associate Professor” in the area of higher education - 5. Technical Sciences, professional field - 5.1. Mechanical Engineering, Specialty – “Mechanical engineering, resistance of materials”

In the competition for associate professor, announced in the State Gazette, issue 68/31.07.2020 and on the official website of TU-Gabrovo for the needs of the department of “Technical Mechanics” at the Faculty of Mechanical Engineering and Instrumentation, Senior Assistant Vladimir Petrov Dunchev, PhD – Technical University of Gabrovo, is participating as the only candidate.

## 1. Common feature of the candidate

Senior Assistant Vladimir Dunchev, PhD graduated from “Ivan Gyuzelev” Mathematical High school Gabrovo in 2005 and got his Master’s degree in 2011 in “Construction of buildings and facilities” at the University of architecture, civil engineering and geodesy. In 2014 he defended his doctoral dissertation in the scientific specialty “Applied Mechanics” on the topic “Information and calculation system for bidding and optimal design of metal structures of bridge cranes”.

Dr. V. Dunchev began his career in 2011 as a designer in a company “Christian–Neiko 90” - Sofia. From 2015 to 2016 he was an Assistant Professor in Technical College - Lovech in association with TU-Gabrovo, and from 2016 to 2017 he was an Assistant Professor in department of Technical mechanics at TU-Gabrovo. From 2017 he is a Senior Assistant in the same department.

## 2. Overview of the content and results in the presented works

The candidate Senior Assistant Vladimir Petrov Dunchev, PhD apart from the scientific works on the dissertation, presented a total of 26 works that are in the field of competition and can be classified into the following groups:

a) Scientific publications in issues that are referenced and indexed in world-famous databases of scientific information

- Eleven articles with Impact factor, of which ten [B.1. ÷ B.10.] are thematically related and presented as a habilitation work, entitled “Increasing the fatigue strength of metal structural elements through static surface plastic deformation”. This work deserves high praise, as an in-depth comprehensive research, fully meeting the “minimum national requirements” for habilitation work;

b) Scientific publications in non-referenced journals with scientific review or in edited collective volumes

- Ten articles in journals in Bulgaria, nine of which [Г.2. ÷ Г.6 и Г.8. ÷ Г.11.] are in the “Journal of the Technical University of Gabrovo”, which is monitored by the Web of Science

- Three scientific papers at a National conference on mechanical engineering and machine science, held in Varna, Bulgaria [Г.12. ÷ Г.14.];

c) Published textbooks

- Two textbooks in electronic format - a guide for solving problems in static and a guide for solving problems in kinematics. Of all 24 scientific articles Dr. V. Dunchev is an independent author in six, two of which are in English. He is stated as the first co-author in six, of which one in English and as a second sole co-author in one, which is in an international magazine with Impact factor. The candidate is the sole author of both textbooks.

Summarizing the results of the presented works, it is evident that they cover and exceed the minimum national requirements in the Law on Academic Staff Development in the Republic of Bulgaria (indicators from groups B and Г), as well as the minimum requirements of the Technical University – Gabrovo for the academic position “Associate Professor”.

### **3. General characteristics of the candidate’s activity**

#### **3.1. Educational and pedagogical activity (work with students and doctoral students)**

For the last two academic years the candidate has led lecture courses in: Mechanics in volume of 45 hours; Mechanics I of 60 hours; Mechanics II of 15 hours and Resistance of materials of 15 hours. Exercises in 7 subjects were conducted as well.

The presented two joint publications with doctoral students at the department show that there is successful work on this indicator as well.

#### **3.2. Scientific and scientific-applied activity**

In the last six years and currently Dr. V. Dunchev has participated in seven research projects, one of which funded by OP “Science and Education for Smart Growth”, one funded by the National Fund “Scientific Research” and five funded by the University Fund “Scientific Research” at TU-Gabrovo.

The report submitted by the candidate includes 15 citations, all of which are in referenced and indexed scientific journals. Four of them are in journals with a high Impact factor - 3 in journals with an IF above 4.0 (Journal of Manufacturing Processes and Tribology International) and 1 in a journal with an IF above 7.0 (Journal of Cleaner Production). This fully covers and exceeds the requirements for indicator E. At the time of writing this opinion, in reference to Scopus, I found that Dr. V. Dunchev has 41 citations from 10 monitored articles and his h-index is 4.

The candidate maintains and modernizes the material and technical base of the “Technical mechanics” department, used in scientific research, precisely: modification of a MUI6000 fatigue test machine and a universal Brinell hardness tester; renovation of a UMB fatigue testing machine; laboratory installation for experimental determination of sliding friction coefficients and rolling friction coefficients.

#### **3.3. Implementation activity**

No implementation documents have been submitted

### **4. Contributions and their significance for science and practice**

The author's report on the contributions is too voluminous. I accept these contributions and summarize them only by category, without quoting them.

#### **4.1. Scientific contributions**

- *Proving with new means of significant new aspects of already existing scientific fields, problems, theories, hypothesis, etc.* One scientific contribution [B.5]

- *Obtaining and proving new facts.* One scientific contribution. [B.1, B.3, B.7, B.10].

#### **4.2. Scientific and applied contributions**

- *Obtaining and proving new facts* - 7 contributions have been formulated [B.5, B.8, B.1, B.3, Г.10, Г.11, Г.13, Г.2].

- *Obtaining of confirmatory facts* – 7 contributions [B.1, B.2, B.3, B.4, B.5, B.6, B.8, B.9, B.10, Г.2].

- *Creating new classifications, methods, approaches, algorithms, constructions, models, etc* – 18 contributions [B.2, B.4, B.5, B.6, B.7, B.9, B.10, Г.14, Г.1, Г.3, Г.4, Г.5, Г.6, Г.9, Г.12, Г.8].

#### **4.3. Applied contributions**

Total of 8 [B.1-B.6, B.8, B.10, Г.2, Г.7]

### **5. Assessment of the personal contribution of the candidate**

I believe that the personal contribution of Dr. V. Dunchev in the results obtained from the scientific and scientific-applied fields is essential and significant.

Conducting the experiments, analyzing the data and publishing the results are collective work in which the candidate has a significant contribution. The presence of a large number of co-authors in the presented works, including doctoral students, is an indicator of skill for good teamwork.

The candidate has contributed to the modernization and maintenance of the laboratory base for research.

### **6. Critical remarks and recommendations**

From everything said so far, the indisputable merits of the presented materials are evident. I have no critical remarks to the candidate. I recommend him to continue working with the same enthusiasm.

### **7. Personal Impressions**

I know Dr. V. Dunchev slightly and I have no direct personal impressions. Given that I know well the scientific team in which he works, I can conclude that the candidate performs his tasks responsibly and precisely and has a favorable environment for his further development as a scientist.

### **8. Conclusion:**

**Considering the above, I propose Senior Assistant Professor Vladimir Petrov Dunchev, PhD to be elected as an “Associate Professor”, in field of higher education – 5. Technical sciences, by professional field – 5.1 Mechanical Engineering, Specialty – “Mechanical engineering, resistance of materials”**

16.12.2020

Member of the jury: /signature/

/Assoc. Prof. Valentin Petkov, PhD/