

## STATEMENT

**by competition for the occupation of the academic position "Associate Professor" in the Professional field 5.5. Transport, shipping and aviation, specialty "Testing and control of transport equipment"**

**announced in the State Gazette number 31 of 19.4.2022.**

**with candidate, Chief Asst. Prof, Eng. Veselin Todorov Mihailov, PhD,**

Member of the scientific jury, Prof., Velizara Ivanova Pencheva, PhD,  
(on the basis of order № 473 of 28.06.2022 of the Rector of TU-Varna)

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

In order to participate in the competition for the academic position of "Associate Professor", the candidate Chief Asst. Prof, Eng. Veselin Mihailov, PhD submitted 35 scientific papers. The scientific works are as follows: presented as equivalent to a habilitation work - 10 scientific publications and 3 scientific publications in publications that are referenced and indexed in world-famous databases with scientific information; 22 scientific publication in non-refereed peer-reviewed journals or in edited collective volumes. Of the 35 publications submitted for participation in the competition: 7 are scientific articles in journals (of which 2 are indexed in SCOPUS and WoS and fall into Q2, 6 were published in journals abroad and 1 in Bulgaria; all published in English); 28 have been published in collections with conference reports (of which 11 are indexed in SCOPUS and are respectively in English; 17 are in collections of reports with ISBN, of which 3 are in English and 14 in Bulgarian; in terms of conference venue, 3 are abroad and the rest in Bulgaria).

In the chapters proposed as equivalent to a monographic work Chief Asst. Prof, Eng. Veselin Mihailov, PhD is a co-author, taking first place in two. These publications are in the topic area "Basic test methods for engines and transport equipment".

The candidate has participated in two scientific research projects financed by the National Research Fund, as in one of them (project KP-06-M37/4 "Investigation of the influence of malfunctions in the fuel supply system of gasoline engines with an additionally installed gas fuel injection system on the environmental indicators of the car", 2019-2021) was the leader. In addition, he participated in 19 projects from the TU-Varna internal competitions under the Scientific Research Fund, of which he was the head of 4 of them, with implementation in the period 2019-2021.

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

The candidate has been a teacher at Varna Technical University since 2008 and held the position of assistant until 2017, and since 2017 the position of chief assistant. As an assistant, he led exercises and course projects in the disciplines: "Environmental characteristics of transport equipment", "Testing of internal combustion engines and transport equipment", "Dynamics and oscillation of internal combustion engines and transport equipment" - for students studying at OKS "bachelor"; "CAD systems in automotive engineering", Methods of car diagnostics", "Vibration isolation of internal combustion engines" - for students studying in the Master's degree. As the chief assistant, he leads lectures and exercises in the disciplines: "Internal combustion engines", "Testing of internal combustion engines and transport equipment", "Systems for automated design in TT", "CAD systems in automotive engineering", Methods of car diagnostics ", "Vibration isolation of internal combustion engines". The large number of taught disciplines, their diversity, as well as the multidisciplinary of some of them speaks of the good pedagogical and professional training of the Chief Asst. Prof, Eng. Veselin Mihailov, PhD. Excellent command by the candidate of CAD programs - Solid Works, AutoCAD and a good command of the program for mathematical calculations Mathcad are excellent conditions to support the conduct of a quality learning process, including with scientific research elements in it. The average lecture load of the candidate for the last three years is 576 hours.

Chief Asst. Prof, Eng. Veselin Mihailov, PhD actively works with students trained in the professional direction 5.5. Transport, shipping and aviation. Under his leadership, 17 graduates



successfully defended their diplomas. He supports the work of doctoral students in the department and, together with students, successfully includes them in research teams in the development of projects. He is the head of the student club "TU-Varna Motorsport".

Chief Asst. Prof, Eng. Veselin Mihailov, PhD, participates in the maintenance and renovation of Laboratory 712BM "DVG Testing", at the "Transport Engineering and Technologies" Department of the Technical University of Varna. According to a project led by him with funding external to the university, modern equipment was provided (including a modern 5-component gas analyzer Bosch BEA 550 and a stand for testing injectors from ASNU) for over BGN 15,000. The candidate also participated in the development of over 20 research projects, with the help of which the material base of the "TTT" department and the university as a whole was improved.

The three-month specialization at the University of Tokyo in Japan and the short-term specialization at the Wroclaw Technical University - Poland, as well as the annual Erasmus teaching mobilities after 2016 in Romania, Poland, Portugal, are indicative of the candidate's desire for self-improvement and recognition and transfer of foreign experience in the learning process and scientific research.

### **3. Basic scientific and scientific-applied contributions.**

I accept those formulated in the reference of Chief Asst. Prof, Eng. Veselin Mihailov, PhD, contributions reflected in the publications and research projects presented for the competition in the four thematic areas: Thematic area 1. Study of fuel supply parameters in internal combustion engines [B4.1], [B4.7], [B4.8], [Γ7.2], [Γ7.3], [Γ8.9], [Γ8.20]; Thematic direction 2. Noise and vibration environmental characteristics of internal combustion engines and transport equipment [B4.4], [B4.5], [Γ8.2], [Γ8.7], [Γ8.11], [Γ8.13], [Γ8.16]; Thematic direction 3. Factors affecting the development of the work process (additives to fuels, alternative fuels) [B4.2], [B4.6], [B4.9], [B4.10], [Γ7.1], [Γ8.1], [Γ8.17], [Γ8.19], [Γ8.22]; Thematic direction 4. General scientific research in the field of transport technology [B4.3], [Γ8.2], [Γ8.3], [Γ8.4], [Γ8.5], [Γ8.6], [Γ8.8], [Γ8.10], [Γ8.12], [Γ8.14], [Γ8.15], [Γ8.18], [Γ8.21].

Scientific works contain scientific, scientific-applied and applied contributions.

I consider the presented 10 publications from group "B - Habilitation work - scientific publications in publications that are referenced and indexed in world-famous databases with scientific information" to be equivalent to a monographic work, united under the general title: "Basic methods for testing engines and transport technique".

Scientific contributions: study of the performance of diesel LPG with modified fuels and nano additives [B4.2], [B4.6]; creation and verification of an approach to study the phases of fuel supply in a Common Rail battery system [B4.7]. Scientific contributions I attribute to the group: formulation or justification of a new scientific field or problem; formulating or justifying a new theory or hypothesis.

In general, the scientific and applied contributions are concluded in the following: a system was created for modeling the composition of the fuel when using biogas as a fuel for liquefied natural gas [B4.9], [Γ8.19]; a methodology was developed for the study of environmental and noise characteristics of engines in transient modes [Γ7.1]; a methodology was created to study the influence of the parameters of the control pulse on the operation of low-resistance injectors for engines with forced ignition, [Γ7.2], [Γ7.3], [Γ8.20]; a new method was created to study the possibilities of exhaust gas recirculation technology for reducing NOx emissions [Γ8.17]; a method of studying the fuel supply through the stroke of the armature of gas solenoid valves has been perfected [Γ8.2], [Γ8.9]; the noise characteristics of fuel solenoid valves from fuel equipment were investigated and a diagnostic parameter was determined for acoustic diagnostics based on harmonic analysis results [Γ8.7]. Scientific and applied contributions can be related to: useful enrichment of knowledge in the scientific field; use of classical and modern approaches and methods for analysis and research, to prove and confirm scientific facts.

Applied contributions: a research system was established to study the environmental performance of automotive engines [Γ8.1]; a driver pre-sleep state prediction system based on driver face



recognition was developed [Г8.21]. I associate the applied contributions with a specific solution to a narrowly formulated task from a given scientific field with immediate practical applicability.

Scientific and scientific-applied contributions are proof of the candidate's good theoretical preparation, as well as his ability to evaluate new technologies and techniques and apply them to the development of research in transport engineering. Applied contributions reflect the realization of scientific and scientific-applied contributions, and are evidence of the applicant's ability to apply them in transport practice, which I find very useful.

I accept that the contributions formulated by the candidate are his personal work or with his active participation. This is evidenced by the publications in which he is the first author, as well as the presented reference for his participation in research projects.

From the reference for the citations of Chief Asst. Prof, Eng. Veselin Todorov Mihailov, PhD, 8 cited world-famous databases with scientific information are known. The applicant has not provided in the documents a reference for citations in non-refereed peer-reviewed journals.

#### **4. Significance of contributions for science and practice.**

I conclude that the presented scientific works are significant and contain a sufficient number of scientific, scientific-applied and applied contributions. They have been reported in authoritative scientific forums or published in reputable journals and have become sufficiently known to the scientific community. Some of them have found a specific practical application. According to the reference made in Scopus Chief Asst. Prof, Eng. Veselin Todorov Mihailov, PhD has a Hirsch index of 3, which indicates the candidate's scientific interest in research.

The materials for the competition fully meet the quantitative indicators of the criteria for occupying the academic position of "docent" at the Technical University of Varna.

#### **5. Critical notes and recommendations**

I have no fundamental remarks about the materials presented by the candidate for the competition. In the future, I recommend that the candidate publish textbooks and teaching aids in the disciplines in which he leads classes, as well as publish independent articles and reports, or those of which he is the lead author.

#### **CONCLUSION**

Bearing in mind the above, I believe that the scientific and educational activities of the candidate fully meet the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its Annexes and the Regulations for the Terms and Conditions for Holding an Academic Position at the Technical University of Varna.

Based on my familiarity with the presented scientific works, their importance, scientific, scientific-applied and applied contributions contained in them, I find it reasonable to propose Ch. Assistant PhD. Eng. Veselin Todorov Mihailov to take the academic position of "associate professor" in professional direction 5.5. Transport, shipping and aviation in the specialty "Testing and control of transport equipment".

**Дата: 27.08.2022**

**Prepared the Stateme**

/Prof., V. Pencheva, PhD/

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