

## **STATE IN A COMPETITION**

Prepared the opinion: Eng. Todor Stoyanov Djamiykov, PhD, Professor, at Technical university of Sofia, a member of the Scientific Jury by order of the Rector of PU, № P33-4298 from 10.08.2021.

For an academic position "Associate Professor" in a professional field 5.2. Electrical Engineering, Electronics and Automation, scientific specialty " Electronics, Communications and Information Technology, " for the needs of the Department of Physics and Technology at the University of Plovdiv "Paisii Hilendarski", with candidate: Dr. Eng. Rumen Kostadinov Popov, Docent.

### **1. General description of the submitted materials**

For participation in the announced competition, a single candidate has submitted documents: Dr. Eng. Rumen Kostadinov Popov.

The set of materials presented by Dr. Eng. Rumen in Popov is in accordance with the Regulations for development of the academic staff of PU, and includes the following documents: application form to the Rector for admission to the competition; autobiography in European format; diploma for higher education with acquired educational-qualification degree "master" - original with attachment or notarized copy; diploma for educational and scientific degree "Doctor" - original or notarized copy; diploma (certificate) for the academic position "associate professor" - original or notarized copy, or order of the rector (director) of a higher school or scientific organization for approval of a choice to hold the academic position "associate professor"; list of scientific works; reference for compliance with the minimum national and additional faculty requirements (if any); declaration of originality and authenticity of the attached documents; annotations of the materials under Art. 76. from PRASPU including self-assessment of the contributions; document (certificate) for work experience; documents for educational work; research documents.

To participate in the competition for professor, the candidate Dr. R. Popov has submitted 35 scientific papers, 1 book on defense dissertation, 4 textbooks and textbooks and a list of 4 research papers. The applied scientific papers on the dissertation for acquiring ONS doctor, the papers for obtaining the academic degree "associate professor" and a book on defensive dissertation are not reviewed. Of the presented scientific papers, 3 are in Bulgarian. A list of cited citations is not provided. Documents (in the form of official notes) for printed study materials in the publishing house of Paisii Hilendarski University of Plovdiv and for participation in research projects are presented.

### **2. General provisions and biographical data**

Dr. Rumen Popov was born in 1964. In 1982 he graduated from high school with a diploma for a specialist in production automation from the Technical School of Electrical Engineering in Plovdiv. In 1990, he graduated from the Tula Polytechnic Institute in Russia,

receiving a diploma with honors in automatic control systems. He started his career as a designer of radio-electronic systems at Aviotekhnika - Plovdiv. Since 1991, he has been an assistant and successively senior and chief assistant, and since 2011 he has been an Docent at the Technical University - Sofia, Plovdiv branch, until 2015. For a short time in 2012-2013, he was an Docent at the now defunct University of Pernik. In 2014 - 2017, he was an Docent at the Technical College - Smolyan. Since 2015 until now, he has been an Docent at Plovdiv University "Paisii Hilendarski".

From the presented CV and copies of diplomas, it is not clear how many competitions for the academic position of "Docent" Dr. R. Popov has applied for.

### **3. Personal impressions and opinion of the reviewer**

I do not know Dr. R. Popov personally, but I appreciate the results of his work, included in scientific publications and projects, as well as the accumulated knowledge and experience.

I have no common publications with him and I am not a related person, within the meaning of the law.

### **4. General characteristics and contributions from the research and the scientific-applied activity of the candidate.**

From the presented materials, lists and official notes the voluminous educational activity conducted by the candidate during the last 5 years is evident. The study load during the period varies from 500 to 870 study hours. Which is a big enough load. During this period, he led classes, lectures and exercises in many different disciplines. He has participated in the development and updating of curricula for students and the preparation and adoption of curricula for the bachelor's course - 14 disciplines and the master's course of 4 disciplines. The presented materials eloquently show the active educational activity of Dr. R. Popov and his successful work with students.

A list of 4 titles of published study materials is presented. I question the publication "Programmable Logic Controllers - Zelio Logic Controller Programming Guide" as a textbook. The title itself states that it is a guide. The English edition that is presented does not have a corresponding discipline in the list of conducted disciplines. There is a lot of high-quality literature, standards and company explanations on the topic in the English-language literature. I accept the published material as an additional activity of the candidate, and not as educational material.

Many of the published scientific ideas and solutions have been reflected in the works of other scientists. In the presented materials, the list with the noticed citations is strangely presented and it is difficult to orient one quickly. A check in the public SCOPUS database shows - 16 publications visible and 126 citations, while in the documents I counted 35.

Systematically, the contributions of Dr. R. Popov with the publications in renowned publications, united by me, are the following:

1. The thermal characteristics (undisturbed temperature value, thermal resistance of the vertical ground heat exchanger (VZT) and thermal conductivity of the earth layers around VZT using different methods are studied] [D7.1, D7.10).
2. Methods and algorithms for research and modeling of hybrid systems with ground-connected heat pump and solar collectors have been developed. Methods and tools for mathematical modeling and simulations of the main components of HTS and their work in general are presented [D7.2, D8.7, D8.14].
3. Algorithms for identification of systems using methods of artificial intelligence (real and integer coded genetic algorithm and algorithm for optimization with a swarm of particles) have been developed and studied. The results can be used in estimating the parameters of complex systems [D8.4, D8.5].
4. Experimental and numerical studies of accumulators based on MPFS for applications for storage of solar thermal energy have been performed. By charging a latent heat accumulator (LTA) based on MPFS, its energy storage capacity is determined. It is compared to that of a storage tank without MPFS, filled only with water - volumetric heat storage (OST) [D8.11].
5. An experimental study was conducted to compare the efficiency of electricity generation of photovoltaic and photovoltaic-thermal solar panels. The limits of effective operation of the PV / T panel are set. The results of this study allow for the correct choice of the thermal mode of operation of PV / T panels [D8.12].
6. The effect of the design parameters on the energy characteristics of the Darrieus turbine is studied. The dependence of the maximum utilization factor of vertical axis wind turbines on the number of blades with constant fill factor  $a$ , on the number of blades with their constant width, on the elongation of blades  $A$  shown on the basis of these results is shown [D8.9].

I support the author's reference for the contributions from the creative activity of the candidate and I classify them as scientific-applied and applied.

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

I believe that the personal contribution of Dr. R. Popov in the publications presented to the scientific community is indisputable and significant. The complex nature of the works with which Dr. R. Popov participates in the competition has forced him to work in a team and therefore there is a lack of independent research papers. It is noteworthy that the publications have an in-depth analytical part, clear conclusions and serious literary substantiation.

The review of the documents of Dr. R. Popov shows that the procedural and legal requirements arising from the Regulations for the terms and conditions for holding academic positions at the University of Plovdiv are met and the minimum requirements are met and over-met by the candidate. for "professor", according to the Annex of the Regulations of PU "Paisii Hilendarski".

The candidate in the competition has not been legally proven plagiarism in the scientific works (Art. 24. Para. 5 of the Law on Public Procurement).

## 6. Critical remarks and recommendations

I have the following notes to the evaluated materials presented in the competition, which do not reduce the significance of the obtained results, but rather can be considered as recommendations for the future creative activity of Dr. R. Popov.

1. In his work to focus on two or three problems, which he thoroughly and consistently develops in his scientific works. There is a great variety in the topics presented in the competition.
2. Summaries and assessments of the results of the publications could be made in an exact manner, which would lead to a more accurate and representative design of the candidate's contributions to the academic position of "professor".
3. I recommend that more scientific publications be made in reputable publications with an impact factor or rank.

### CONCLUSION

The results achieved by Dr. Eng. Rumen Popov in teaching and research fully comply with the specific requirements of the Faculty of Physics and Technology, adopted in connection with the Regulations of PU - "Paisii Hilendarski" for the application of ЗРАСРБ.

After being acquainted with the materials and scientific papers presented in the competition, analysis of their importance and the scientific, scientific-applied and applied contributions contained in them, I confidently give my positive assessment and recommend the Scientific Jury to prepare a report-proposal to the Faculty Council. Faculty of Physics and Technology for election of Dr. Eng. Rumen Kostadinov Popov to the academic position "Professor" at the University of Plovdiv "P. Hilendarski "by professional field 5.2. Electrical engineering, electronics and automation, scientific specialty "Automated systems for information processing and control".

October 10, 2021  
Sofia

Signature:.....  
( prof. Dr. Eng. Todor Djamiykov )