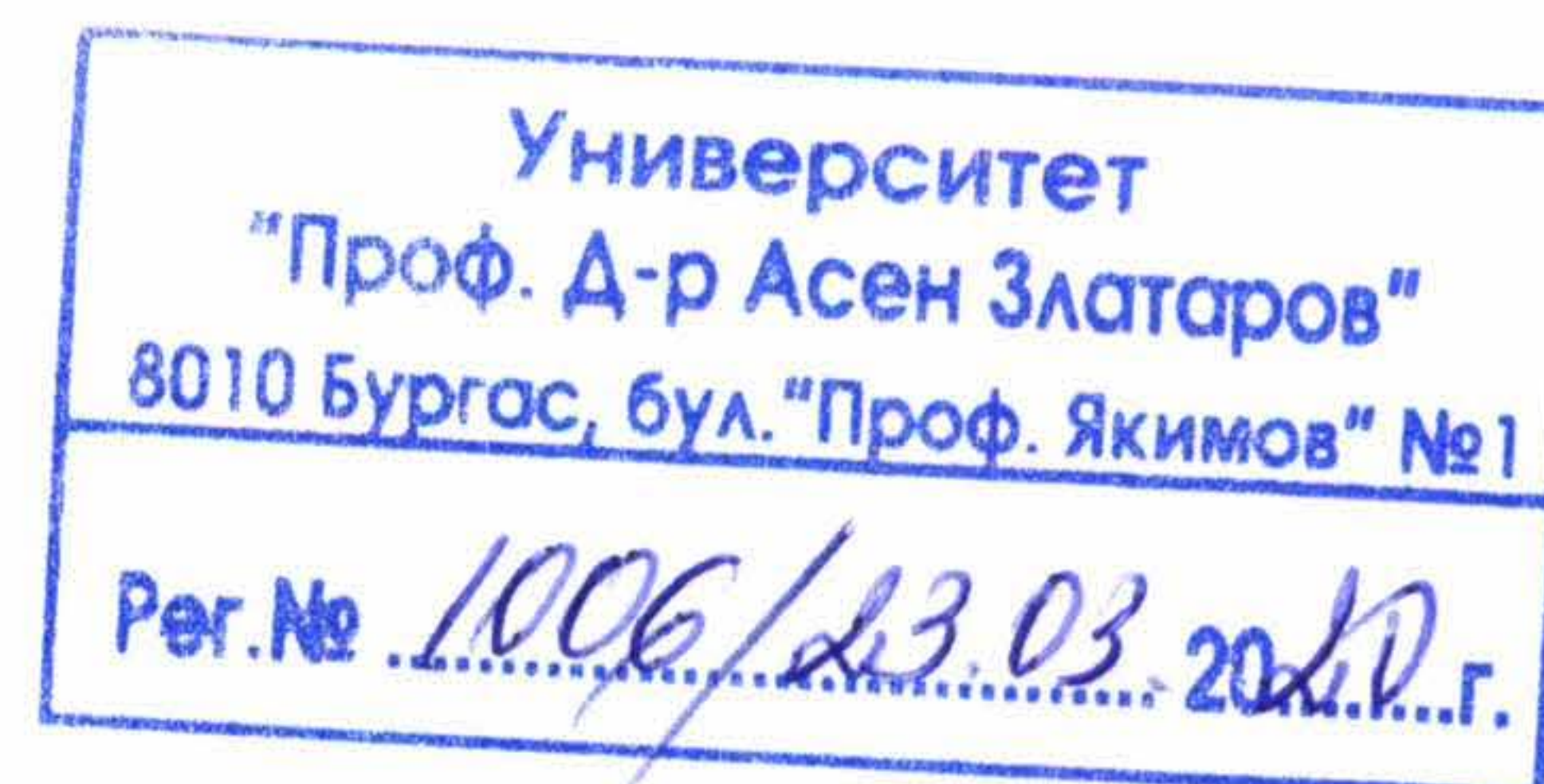


REVIEW



on a competition to occupy an academic position "Associate Professor" In field of higher education 5. "Technical Sciences", professional direction 5.2 "Electrical, Electronics and Automation", scientific specialty "Elements and devices of automation and computing (Sensors and sensor devices)", declared in the State Gazette, issue 93/26.11.2019 for the needs of the department of "Electronics, Electrical engineering and Machine science" of the "Prof. Assen Zlatarov" University with the candidate Ivaylo Raychev Belovski, PhD., Eng., chief assistant

Member of scientific jury: Ivan Borisov Evstatiev, PhD, Eng., professor, "Angel Kanchev" University of Ruse.

In the competition, announced by the "Prof. Asen Zlatarov" University for the occupation of academic position "Associate Professor" in the field of higher education 5. Technical sciences, professional direction 5.2 Electrical, electronics and automation in science specialty "Elements and devices of automation and computing (Sensors and sensor devices)" for the needs of the department of "Electronics, Electrical engineering and Machine science", as a candidate participates Ivaylo Raychev Belovski, PhD., Eng., chief assistant from the same department.

1. Short Biographical data

Ivaylo Raychev Belovski graduated from secondary school in Sredec, Bulgaria in 1991. Master's degree in Radio and Television Technics was obtained in 1998 at the Technical University of Varna. Doctoral degree Ivaylo Belovski obtained in 2016 at Technical University of Gabrovo.

Biography as a specialist eng. Belovski began in BTC (Vivacom) in Department of Telecommunications as High Frequency Systems Engineer, later as Digital Commutation Engineer. From 2006 he works as a telecommunications engineer in the SD "ELTA-R" and since 2010 is an engineer installation in "Nexcom-Bulgaria" EAD. Assistant professor in department "Electronics, Electrical engineering and Machine

science " of the "Prof.. Assen Zlatarov" University, eng. Belovski has been since 2012. After defending her thesis in 2016. so far, Belovski is the chief assistant in the same department.

2. General description of the materials presented

To participate in the competition, the applicant submitted the titles of 1 monographic paper 219 pages, co-authored with the topic "Research and modelling of thermoelectric energy converters" and **28** scientific publications. Of these, **7** scientific publications have been referenced and indexed in world-renowned scientific information databases, **13** are scientific publications in non-refereed scientific peer-reviewed journals or in peer-reviewed volumes, **3** are reports at international scientific conferences abroad and **5** are reports at international scientific conferences in Bulgaria.

Reference citations contains 12 citations.

A list of **3** study tools has been presented, **7** curricula have been developed, a list of **12** disciplines in which the candidate has taught lectures and exercises at Bachelor's and Master's degrees over the last three years.

In addition to the materials submitted for the competition, the candidate has authored **6** more publications.

3. General characteristics of the applicant's research and applied activities

A. Scientific and applied scientific activity

From the presented materials it follows that the applicant's overall research and application activity is related to research, process modeling, information processing, development of electronic equipment in the following main areas - thermoelectric energy converters, thermoelectric modules and systems, neural networks, sensor systems and process management.

The applicant has participated in **4** national research or educational projects, **1** international, **1** external and **8** internal university research projects.

The topics of research and applied development coincide with the direction of the applicant's research and pedagogical activity. Almost all contracts are related to solving specific problems related to research, information processing and site management.

In general, this activity could be characterized as theoretical and applied process studies, mainly in the field of thermoelectric energy converters, thermoelectric modules and systems, sensor systems and process control.

B. Implementation activities

Research and implementation is mainly focused on thermoelectric modules and systems. The applicant has also been involved in lighting projects, DDS signal generators, fiber optic cables and microsensor devices, systems and sensor networks.

The implementation activity is presented by the applicant with his participation in 8 research and applied projects.

All this characterizes the author as a scientist whose activity is oriented towards solving specific problems.

4. Assessment of the candidate's pedagogical preparation and activity

According to the materials presented, the more important achievements of Ch. Assistant Professor Ivaylo Raychev Belovski in the field of educational and pedagogical activity are the following:

Practical, laboratory and seminar classes, course projects, lectures with students in the following disciplines were conducted:

I. In Professional Bachelor's Degree and Bachelor's Degree:

- introduction to the specialty;
- technological workshop;
- educational manufacturing practice;
- sensors and sensor devices;
- measurements in electronics;
- materials and components in electronics;
- electronics;
- semiconductor devices.

II. In the Master's Degree Program

- electronic transport management systems;
- electronic circuitry
- industrial electronic devices;

- engineering presentations;

There are 7 curricula developed by the applicant, he was the head of 21 successfully defended the graduate. 3 exercise manuals have been developed.

All this leads me to conclude that eng. Belovski has a variety of teaching activities and is versatile in the field of electrical engineering and electronics.

5. Scientific and applied scientific contributions

I accept the contributions graded and presented by Dr. Belovski.

A. Contributions to monograph work

Scientific contributions include:

- Theoretical and experimental models of thermoelectric models have been developed
- cooling systems and thermoelectric generators, based on Peltier and Zeebeck modules, constructed by regression analysis, finite difference method, neural network.

Applied contributions include:

- A user application has been created to calculate the basic thermophysical parameters of Peltier modules and to graphically represent their conversion characteristics.

B. In the publications presented, outside the monograph work

Scientific contributions include:

- processes in thermoelectric modules and systems have been modeled using analytical and statistical methods - finite difference method, regression analysis method [3.3, 3.4, 3.6, 3.17];

- models based on neural networks and algorithms for their training in thermoelectric systems have been developed [2.1, 2.2, 2.3, 2.4, 3.15].

Applied contributions include:

- thermoelectric modules in cooling and generation modes of were investigated. On the basis of the obtained results, variants for their optimization have been proposed [2.5, 2.6, 2.7, 3.7, 3.9, 3.10, 3.11, 3.12, 3.13, 3.14, 3.16, 3.19, 3.20];

- technical solutions for sensory systems for process control have been proposed [3.1, 3.2, 3.5, 3.8, 3.18, 3.21].

C. Educational and methodological contributions

They are contained in 3 manuals for laboratory exercises - "Semiconductor Element Laboratory Exercise Manual", "Semiconductor Element and Modules Laboratory Exercise Manual", "Electronics Measurement Laboratory Exercise Guide". Two of the guides are co-authored and one is a stand-alone.

Considering the considerable pedagogical experience gained in conducting classes in 12 disciplines, the creation of 3 manuals for laboratory exercises, the leadership of 21 successfully defended the graduate and the development of curricula, it can be argued that the applicant has significant educational and methodological contributions in the field of mastering the knowledge related to the applications of modern electronics in practice.

6. Significance of contributions to science and practice

The most characteristic of the research and applied activity of Dr. Eng. Ivaylo Belovski, which is evident from the presented documents, is that it is oriented to solving specific problems of practice with the use of the most modern tools. I think of particular importance to science and practice are the research, modeling, methodologies, and the development of systems using Peltier elements.

7. Assessment of the applicant's personal contribution

In the presented works for this competition, Eng. Ivaylo Belovski is an independent author of 5 issues. individual publications. Co-authored publications are 24 in number, with the first author in 20 publications.

The applicant has participated in 8 research projects.

There is a strong teaching activity, both teaching and publishing.

I believe that beyond any doubt is the personal contribution and the leading role of the candidate in the production presented.

8. Critical notes and recommendations

In the applicant's further activities, I would recommend that the following be borne in mind - to draw attention to the implementation in the practice of its development. I believe that the applicant's developments and contributions are extremely important to the industry, especially those related to the application of Peltier elements.

To lead major research and finance projects.

9. The personal impressions and opinion of the reviewer

I know the candidate from scientific conference meetings. From my observations on the submitted materials for this competition, I can say that the candidate has excellent training in the field of competition. Has an affinity for the development of modern electronic devices. My personal opinion is that with the successful completion of the competition, Prof. Assen Zlatarov university will receive a very good young, energetic, educated and intelligent teacher.

10. Compliance with the NACID requirements for responding the national minimum requirements under art. 2b, (2) and (3), respectively, of the requirements of art. 2b, (5) of Act of Development of the Academic Personnel of the Republic of Bulgaria (ADAPRB), designated in the Rules of the Implementation of the ADAPRB for academic position Associate Professor in the professional field 5.2. Electrical Engineering, Electronics and Automation

The applicant's publication and scientific activity for the opening of a procedure for associate professor in the professional field of Electrical Engineering, Electronics and Automation, specialty "Elements and Devices of Automation and Computer Engineering (Sensors and Sensor Devices)", "Prof. Assen Zlatarov " University, **Chief Assistant Professor Eng. Ivaylo Raychev Belovski, fully cover the minimum requirements for the academic position of Assistant Professor.**

11. Conclusion

The presence of monograph work, publications outside it, teaching, research, applied and implementation activities, the wide popularity in Bulgaria and abroad, all

give me a reason to be convinced to suggest **Chief Assistant Professor Ivaylo Raychev Belovski** takes the academic position of “Associate Professor” in the professional field: 5.2. Electrical Engineering, Electronics and Automation, specialty "Elements and Devices of Automation and Computing (Sensors and Sensor Devices)", for the needs of the “Prof. Assen Zlatarov ” University.

03.03.2020

Ruse

Reviewer: _____

/I. Evstatiev, PhD, professor/