

REVIEW

According to a competition for the academic position "Associate Professor".
By professional direction: 5.2. "Electrical engineering, electronics and automation"
Specialty: "Electrification".

Announced in the State Gazette, issue 56 of 06.07.2021, under Art. 67, p. 1.

**candidate participates Ch. Assistant Professor Eng. Daniela Zhekova Mareva
PhD.**

at the Center for Informatics and Technical Science of BFU

Member of the scientific jury: Assoc. Prof. Dr. Eng. Kamen Dimitrov Seymenliyski

Center for Informatics and Technical Science of BFU

1. General biographical data.

The announcement of a competition for the academic position of "Associate Professor" is at the suggestion of the Academic Council at CITN of Burgas Free University and is approved by the educational and scientific council of Burgas Free University, in compliance with all regulatory requirements. The announcement was published in the State Gazette no. 56 from 06.07.2021 and on the website of Burgas Free University.

The only candidate who submitted documents and was admitted to participate in the competition is Ch. Assistant Professor Dr. Eng. Daniela Zhekova Mareva.

Ch. Daniela Zhekova Mareva, Ph.D. In 2016 Acquires the educational and scientific degree "Doctor" at the Technical University of Varna - Faculty of Computer Science and Automation in the professional field 5.2. "Electrical Engineering, Electronics and Automation", specialty "Power Electronics". The topic of her dissertation is: "Inverter for induction heating of fluids". During the period 2001 to 2016, the candidate held the academic position of "Assistant", and from 2016 until now the academic position of "Chief Assistant" at CITN of Burgas Free University. Her teaching activities include conducting laboratory, seminar and practical exercises in 11 disciplines and lectures in 5 disciplines.

Ch. Assistant Professor Daniela Zhekova Mareva, PhD, uses Russian and English languages.

He is a member of: Scientific and Technical Unions,

Burgas Association for "Development of the Information Society"

2. General description of the presented materials.

The candidate for associate professor participates in the competition with a total of 22 scientific publications and a list of 5 research projects, 1 of which he is a supervisor. She also presented a list of 6 teaching aids. In accordance with Article 49, paragraph 3 of the RULEBOOK FOR THE DEVELOPMENT OF THE ACADEMIC COMPOSITION IN THE BURGAS FREE UNIVERSITY, Ch. Assistant Professor Daniela Zhekova Mareva, PhD, presented a monograph on "Semiconductor converters in electric arc welding". The topic is very relevant due to the great interest of manufacturers and customers of this type of products. An abstract of a dissertation for the educational scientific degree "Doctor" and a list of publications on the dissertation are presented, which are accepted for information and are not reviewed. 22 scientific publications, which are outside the dissertation and are taken into account in the final evaluation, have been accepted for review. They are divided into the following groups:

- Habilitation work - monograph;
- Scientific publications in publications which are referenced and indexed in world-famous databases of scientific information;
- Scientific publications in unrefereed journals with scientific review or in edited collective works;
- Citations or reviews in scientific journals, referenced and indexed in world-famous databases with scientific information or in monographs and collective volumes;
- Citation in monographs and collective volumes with scientific review;
- Citations or reviews in unrefereed journals with scientific review.

Ch. Assistant Professor Eng. Daniela Zhekova Mareva PhD is the first author of 9 publications, second author of 9 publications, third author of 3 publications and 7 independent publications. According to the groups of indicators, the candidate Ch. Assistant Professor Daniela Zhekova Mareva, PhD, presented evidence as follows:

- **Indicators from group A:** *(at least 50 points)* Dissertation for the award of educational and scientific degree "Doctor" "Inverter for induction heating of fluids"
a total of 50 points
- **Group B indicators:** *(at least 100 points)* Habilitation work - independent monograph "Semiconductor converters in electric arc welding"
a total of 100 points

- **Group G indicators:** (at least 200 points) Scientific publications in publications that are referenced and indexed in world-famous databases with scientific information - 4 publications with different numbers of authors: 2 with three authors and 2 with four authors. Scientific publications in unreviewed journals with scientific review or in edited collective works - 17 publications with different number of authors: 7 independent, 3 with two authors, 6 with three authors, 1 with four authors;

- a total of 266 points

- **Group D indicators:** (*at least 50 points*): Citations or reviews in scientific journals, referenced and indexed in world-famous databases with scientific information or in monographs and collective volumes SCOPUS - 8 citations

- a total of 80 points

Citation in monographs and collective volumes with scientific review - 5 citations

- a total of 15 points

The points are summarized in tabular form by groups of indicators and are compared with the minimum national and institutional requirements for candidates for the academic position of "associate professor".

Area 5. Technical sciences PN 5.2. Electrical engineering, electronics and automation

Group of indicators	Contents	Requirement	Execution
A	Indicator1. Dissertation for the award of educational and scientific degree "Doctor"	50	50
B	Indicator 3 or 4. Habilitation work - monograph	100	100
Г	Sum of indicators from 5 to 11	200	266
Д	Sum of indicators from 12 to 15	50	95
E	Sum of indicators from 16 to the end		60
	TOTAL	400	571

3. General characteristics of the research and scientific - applied activity of the candidate.

The research and scientific - applied activity of the candidate in the competition Ch. Assistant Professor Eng. Daniela Zhekova Mareva PhD consists of the following:

The candidate has participated in 5 projects, 1 of which was a manager. Three of them have topics close to that of this competition:

1. "Study of the possibilities of transistor inverters for induction heating of fluids", BSU 2002-2003. The project is institutional (funded by BSU), led by Prof. Dimitar Yudov.

2. "Development and research of a high-efficiency charger", BSU 2003-2004. The project is institutional (funded by BSU), led by Prof. Dimitar Yudov PhD.

3. "Energy-efficient power source", BSU 2012-2013 The project is institutional (with funding from BSU), headed by Ch. Assistant Professor. eng. Mareva PhD.

4. Project for publishing a peer-reviewed Bulgarian scientific publication entitled "Electronic Journal of Computer Science and Communications", determined and funded on the basis of a competition conducted by the Research Fund BULGARIAN SCIENTIFIC PERIODICS - 2017, Contract H DNP 06/52 from 21.12.2017) 2017-2019 Head Prof. Eng. Toshkov PhD.

5. Project under the ERASMUS contract + Program KA2 Strategic Partnerships for vocational education and training, PROJECT № 2019-1-TR01-KA202-074370 "Development of Innovative Learning and Practicing Modules, Implemented in Cloud Computing and IoT in Digital Industry" BSU 2020-2021 Head Prof. Eng. A. Toshkov PhD.

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

Ch. Assistant Professor Eng. Daniela Zhekova Mareva PhD has 20 years of active teaching activity at CITN of Burgas Free University. She has participated in the learning process in the following 14 disciplines:

- "Electronic elements" - bachelor 1 course - lab. exercises and lectures;
- "Measurements in Electrical Engineering and Electronics" - Bachelor 1 year-lab. exercises and lectures;
- "Electrical Engineering and Electronics" - Bachelor 1 year - family and lab. exercises;
- "Signals and Systems" - 1 year bachelor - lab. exercises;
- "Digital Circuitry" - Bachelor 1 year;
- "Power supply devices" - bachelor 2 course - family and lab. exercises and lectures;
- "Electronic circuitry" - bachelor 1 year - family and lab. exercises and lectures;
- "Power electronic converters" - Bachelor 1 course - Lab. exercises;
- "Conversion devices" - bachelor 1 course - lab. exercises;
- "Optical Communications" - Bachelor 1 year - lab. exercises;
- "Emergency modes in electrical converters" - Master 1 course - Lab. exercises;

- "Lighting and installation equipment" - Bachelor 1 year - seminar and lab. exercises and lectures - titular of the discipline;

- "Engineering equipment of hotels and restaurants" - bachelor 1 course - seminar and lab. exercises and lectures - titular of the discipline;

- "Specialized practice" - 1st year bachelor seminar and lab. exercises - titular of the discipline;

Under the leadership of the candidate, 23 graduates have successfully defended, of which 7 for a bachelor's degree and 16 for a master's degree.

She has developed 6 pcs. teaching aids in the disciplines he teaches.

She has developed curricula in the following disciplines:

- "Lighting and installation equipment";
- "Engineering equipment of hotels and restaurants";
- "Specialized practice ";

She has developed e-courses in Moodle in all disciplines.

The long and varied teaching work and the wide topics in the individual disciplines is a proof of the achieved high professional and pedagogical experience of Ch. Assistant Professor Eng. Daniela Zhekova Mareva.

5. Main scientific and applied scientific contributions.

In the presented materials different types of modulation for control of transformer non-dimmable AC/DC/DC converters in nominal mode, designed for LED, are studied, and their energy characteristics are improved. The ways of regulating the parameters of imposed pulses through a certain (additional) current source for a welding inverter with improved parameters have been improved.

The mode of operation of the inverter and respectively the load of the semiconductor elements in different emergency situations is provided, as well as a solution for stress reduction in emergency situations is proposed.

A methodology for designing an inductor for an induction heating device has been defined. The proposed design algorithm provides optimal choice of induction pipe, parameters and dimensions.

The choice of scheme, building elements and the way of regulation improve the operation of multi-station welding units.

The monograph presents six scientific developments of inverter welding sources, each of which solves a problem of welding quality.

- Innovations and improved nodes of some schemes are proposed.
- The methods and schemes for improving the switching characteristics of the converters are considered.
- Formulas for calculation of individual elements are also proposed, on which the characteristics of the circuit solutions depend.
- Some of the characteristics. Have been improved.

I believe that the scientific and applied contributions in this work have a strong applied component relating to the application of improvements and conclusions in circuitry in engineering practice for the purpose of design, analysis of power converters, their control and improved use.

In conclusion, the contributions can be related to improvements in the principle of operation and regulation of power converters and reflect a significant contribution to the results achieved.

6. Significance of contributions to science and practice.

The achieved scientific-applied and applied contributions and results are undoubtedly significant in various fields of power and conversion technology. They have a contribution to the theory, practice and training, because current problems of the development of modern power electronics are posed. The realized ideas and projects of the candidate expand the knowledge and applications in induction heating and electric arc welding units. The use of the new series of powerful semiconductor devices in the design and research of electronic circuits in power electronics and the improved and continuously improved methods of analysis increase the level of education of students.

The candidate's scientific reports and articles have become available to a wide college through publication on the researchgate.net and Scopus Preview platforms. Papers were presented at conferences with international participation in the International Symposium on Electrical Apparatus and Technologies SIELA, International Scientific conference "ELECTRONICS ET, Sozopol, Bulgaria, conferences at BSU, TU-Varna, TU-Ruse and others. Two articles have been published in two foreign journals MIPRO, 2017, 40th Jubilee International Convention May 22 - 26, 2017, Opatija, Croatia and TEM Journal.

Evidence of this are the citations of articles presented in the competition. The total h factor for the Scopus cited in the Scientific Journal is 2.

The presented quantitative indicators meet the criteria for holding the academic position of "associate professor", as this is discussed in detail in item 3 of this review.

I accept the contributions of the candidate Ch. Assistant Professor Dr. Eng. Daniela Zhekova Mareva.

7. Critical remarks and recommendations

I have no serious objections to the materials provided to me.

I note some recommendations:

- In his future work the candidate should devote more time and attention to the implementation of his research results in the real business;
- The topics on which the candidate works are very relevant and the results can find a place in the textbook of power electronics.
- To intensify its publishing activities in reputable international magazines and conferences abroad.

8. Personal impressions and opinion of the reviewer

I know ch. Assistant Professor Daniela Zhekova Mareva, PhD, as a doctoral student and colleague at CITN Burgas Free University. I have excellent impressions from my work and as a teacher in the disciplines presented above. Students also rate it with a maximum score in the surveys.

Personal participation in the monograph is predominant, and in the articles and reports I can confirm that it is also significant. I have observed her work on the projects and I can also give her a very good assessment. He actively participates in the administrative work at the center in accreditations, etc.

9. Conclusion

The educational activity and the scientific creativity of Ch. Daniela Zhekova Mareva, Ph.D. the academic position of "associate professor". I end this review with a positive conclusion for the election of Ch. Assistant Professor Daniela Zhekova Mareva, PhD, for holding the academic position of "Associate Professor" at the Burgas Free University, in the scientific field of Technical Sciences - professional field 5.2."Electrical Engineering, Electronics and Automation" scientific specialty "electrification".

Date: 21.10.2021г.

Burgas

Reviewer:.....

/ *Assoc. Prof. Eng. Kamen Seymenliyski Ph.D* /