

## REVIEW

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of the materials submitted for participation in a competition for the academic position of "Professor" at Plovdiv University "Paisii Hilendarski" in the higher education area : 5. Technical sciences, professional field 5.3. Communication and computer technology (Automation of areas from the intangible sphere - education, science).

In the competition for the academic position "Professor", announced in the State Gazette, no. 92 of 18.11.2022 and on the website of the University of Plovdiv "Paisiy Hilendarski" for the needs of the ECIT Department at the Faculty of Physics and Technology, as the only candidate participates Associate Prof. Eng. Dimitar Mihailov Tokmakov, PhD, from ECIT Department.

### 1. General presentation of the received materials

By order No. ПД-21-329 of 15.02.2023 of the Rector of the Plovdiv University "Paisii Hilendarski" (PU) I have been appointed as a member of the scientific jury of a competition for taking the academic position of "**Professor**" in the PU in the field of higher education 5. Technical sciences, professional field 5.3 Communication and computer technology (Automation of areas from the intangible sphere (education, science)), **announced for the needs of** the department "Electronics, Communications and Information Technologies" (ECIT) at the Faculty of Physics and Technology.

**One candidate** submitted documents for participation in the announced competition:

Assoc. Prof. Eng. Dimitar Mihailov Tokmakov, PhD from the "ECIT" department at the Faculty of Physics and Technology at the "Paisii Hilendarski" PU.

The set of materials presented by Associate Professor Tokmakov is in accordance with the Regulations for the Development of the Academic Staff of the PU (RDASPU), and includes the following documents:

- application form to the rector for admission to participate in the competition;
- CV in European format;
- diplomas for higher education with the acquired educational and qualification degree "master", educational and scientific degree "doctor" and diploma (certificate) for the academic position "Associate professor";
- list of scientific works;
- certificate of compliance with the minimum national requirements;
- declaration of originality and authenticity of the attached documents;
- annotations of the materials under Art. 76. from RDASPU including self-assessment of contributions;

- documents for work experience, academic work and scientific research activity;

The candidate Assoc. Dr. Dimitar Tokmakov has submitted 33 scientific publications and a list of 12 research projects (international and national projects). 33 scientific publications that are outside the dissertation are accepted for review and they are taken into account in the final evaluation. The distribution of scientific publications by relevant rubrics and language of publication is as follows:

- Articles in periodical scientific issues: 10 publications, of which 6 are in Bulgarian and 4 are in English. The publications were printed in the series "Scientific Works of the Union of Scientists in Bulgaria - Plovdiv. Series C. Technics and Technologies" and "Scientific works - SUB Smolyan";
- Reports from conferences: 23 publications in English, including 20 of the published papers that are indexed in world-renowned scientific information databases (WoS, Scopus).

## **2. Brief biographical data about the candidate**

The candidate Assoc. Prof. Dimitar Tokmakov obtained a master's degree in "Electronic Engineering and Microelectronics" at the Technical University - Sofia in 1994, graduating with honors. He obtained his PhD in 2011 at the Technical University-Sofia in the scientific field: 5.2 Electronics, Electrical Engineering and Automation based on a successfully defended dissertation on the topic "Distributed Internet-based environment to support learning in engineering education". In the period 1996 - 2013 the candidate holds the position of chief assistant in the ECIT department, Faculty of Physics and Technology of PU "Paisi Hilendarski" in the scientific field 5.3 "Communication and computer technology". Since 2013 until now, the candidate holds the academic position of "associate professor" in the same department, teaching students in the disciplines "Computer Networks", "Microprocessor Technology", "Computer Modeling and Engineering Design", "Embedded Microprocessor Systems". The candidate is fluent in English and Russian and has a license to drive a motor vehicle, category "B".

Assoc. Prof. Tokmakov has accumulated 27 years of work experience in the field of education, during which time he took part in numerous international educational projects.

## **3. General characteristics of the applicant's activity**

During the last five academic years (2017-2022), the candidate has an average classroom workload of 463.6 hours per year by giving lectures on the disciplines "Microprocessor

technology", "Computer networks", "Computer modeling and engineering design", "Programming microcontrollers in Arduino environment", "Microprocessor systems" and lab works on the disciplines "Microprocessor technology", "Microprocessor systems", "Programming microcontrollers in Arduino environment". For each lectures and practical training courses, the candidate has developed electronic materials in the DIPSEIL educational system. Assoc. Prof. Dimitar Tokmakov teaches students from various specialties at PU "Paisi Hilendarski", Plovdiv and the university base in Smolyan. Since 2015 until 2022 Assoc. Prof. Tokmakov has supervised the work of 17 successfully defended graduates (12 graduates of the "Bachelor" degree and 5 graduates with "Master" degree), and the diploma paper topics are mainly in the field of modern network technologies. In the period 2019-2022 the candidate supervises the work of 2 doctoral students enrolled in the doctoral program "Automation of fields from the non-material sphere (medicine, education, science, administrative activity, etc.)", one of whom has successfully defended a dissertation on the topic "Design, research and optimization of wireless low power consumption sensor nodes".

Assoc. Professor Tokmakov is the author of study programs for the bachelor's degree program in the disciplines "Programming microcontrollers in Arduino environment" (for specialties "Information and computer engineering, "Telecommunications and information systems"), "Computer networks" (for specialties "Information and computer engineering", "Telecommunications and information systems", "Technologies in telecommunications", "Telecommunications with management"), "Microprocessor technology" (for specialties "Information and computer engineering", "Telecommunications and information systems") and for "master" degree in the disciplines "Programming microcontrollers in Arduino environment" (for specialties "Information and computer engineering" - part-time, "Telecommunications and information systems" - after professional bachelor, part-time), "Computer and communication interfaces" (for specialties "Information and computer engineering" - part-time, "Telecommunications and information systems" - after professional bachelor, part-time), "Embedded microprocessor systems" (for specialties "Telecommunications and information systems" - part-time, "Information and computer engineering"), "Microprocessor circuit engineering" (for the specialty "Hardware and software systems" - part-time), "System administration" (for the specialty "Hardware and software systems" - part-time), "Administration of servers" (for the specialty "Information security" - part-time).

The 33 scientific publications submitted for participation in the competition were published in the period 2012-2022. Their distribution according to the year of publication, the number of authors and the position occupied by the candidate in the author's team is presented in Table 1.

Table 1.

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Number of publications	1	-	-	2	2	1	1	6	8	7	5
	1 author		2 authors		3 authors		4 authors		5 authors		
Number of publications	1		21		5		3		3		
Position in the author's team			1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>				
Number of publications			12	16	2	2	1				

With regard to those presented as equivalent to habilitation thesis 10 publications, it can be noted that Assoc. Prof. Tokmakov occupies a leading position in the author's team (1st or 2nd) in 80% of the scientific production. Scientific works represented by indicator **B** form a total of **239** points with the required 100 points according to national minimum requirements. For these publications, the candidate has submitted an extended habilitation reference in a total volume of 78 pages. The results presented in the developments concern current issues in the field of network technologies, measurements in the field of electronics and embedded systems for image analysis, as evidenced by the significant responses received in the scientific community (53 citations were noted, of which 36 in WoS and Scopus). One of the reports in this group "Operational Amplifier Open Loop Gain Simulation in Electronics Engineering Education" (B4.7) was awarded with the "Best Paper Award" in the 2020 "Electronica" scientific conference. Regarding the developments under indicator **B**, the candidate has formed 15 contributions, which are grouped as "Scientific" (8 items), "Scientific-applied" (4 items) and "Applied" (3 items).

The presented contributions relate to the development of IoT technologies by improving communication protocols and the operation of end nodes and sensors in LoRaWan networks; the life cycle modeling of sensor nodes with low consumption and autonomous power from renewable sources; progress of measuring technology by development of contactless measuring devices; application of performance support systems in the education of electrical, electronics, information and computer engineering students.

According to indicator  $\Gamma$ , the candidate presented 23 scientific works, of which 10 were published in issues indexed by WoS and/or Scopus (indicator  $\Gamma.7$ ) and 13 were published in peer-reviewed scientific issues (indicator  $\Gamma.8$ ). According to indicator  $\Gamma$ , the presented publications form a total of **306.31** points with the required 200 points according to the national minimum requirements.

For the publications presented under indicator  $\Gamma$ , Assoc prof. Tokmakov has indicated 21 contributions, of which 6 are defined as scientific, 4 - as scientific-applied and 11 as contributions of an applied nature. I accept the above contributions in substance, but I believe that they could be presented in a more general form, such as the contributions concerning publications  $\Gamma.7.3$  and  $\Gamma.7.10$ , which relate to the development and implementation in engineering education of a wireless sensor node with autonomous power from renewable source that can be presented in general.

According to indicator  $\Delta$ , the candidate has submitted a report on 46 citations noticed in publications indexed in WoS and Scopus, which form a total of **460** points with the required 100 points according to national minimum requirements. Table 2 presents the distribution of the mentioned citations by year.

Table 2.

	2019	2020	2021	2022	2023
Number of citations	5	16	15	9	1

Assoc. Prof. Tokmakov has presented a list of 12 research and educational projects in which he has participated since 2015 until now, having been the head of three of them. Of the presented projects, 9 are international and 3 are financed by the "Scientific Research" Fund at the "Paisii Hilendarski" PU. A significant part of the projects implemented with the participation of Associate Professor Tokmakov relate to the improvement of methodologies in the field of education and were financed under the Erasmus+ program ("Implementation of Software Engineering Competence Remote Evaluation for Master Program Graduates (ISECRET)" implemented in the period 2015-2017 ; "Using mobile technology to improve policy Reform for Inclusion of Disadvantage Groups Education mRIDGE" implemented in the period 2015-2017; "Improving Higher Education Quality in Jordan using Mobile Technologies for Better Integration of Disadvantaged Groups to Socio-economic Diversity mEQUITY" implemented in the period 2015-2018; "Implementation of Education Quality Assurance System via Cooperation of University-Business-Government in HEI - EDUQAS" implemented in the

period 2017-2020; "Embracing diversity in Asia through the adoption of Inclusive Open Practices, DIVERSASIA" started work in 2021 with a deadline of 2024; "Applying some advanced technologies in teaching and research in relation to air pollution" started work in 2022 with a term of 2024). According to indicator **E**, the materials presented by the candidate form a total of **290** points with the required 150 points.

Assoc. prof. Tokmakov has been a member of the Union of Scientists in Bulgaria, Plovdiv branch since 2004, and since 2014 he is the chair of the "Techniques and Technologies" section at SUB-Plovdiv. The candidate was a reviewer of 10 reports and articles in scientific conferences and journals visible in the world-famous databases of scientific information-Scopus and Web of Science.

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

Nearly 52% of the scientific works submitted for participation in the competition (articles in periodicals and reports from conferences) are the result of the candidate's work with the doctoral students supervised by him, which undoubtedly confirms that the presented results were achieved entirely with the participation of Associate Professor Tokmakov. Regarding the rest of the publications, given their subject matter and the candidate's leading position in the author's team, I also consider them to be the candidate's personal work.

#### **5. Critical remarks and recommendations**

In the materials presented for participation in the competition, accuracy in the layout and precision in the speech is noticeable, which speak of high motivation and aspiration for self-improvement. I noticed only some small omissions (for example, for the third scientific-applied contribution of the publications in group **B**, the publication number was omitted, the same applies to two of the applied contributions in this group), which I consider rather technical inaccuracies that do not reduce the significance of the results achieved. In the future, I recommend that the candidate continue his active research work with students and doctoral students, as well as publish articles in prestigious scientific journals with a high impact factor.

#### **6. Personal impressions**

I have known Prof. Tokmakov for almost 10 years in connection with organizing the work of the "Techniques and Technologies" section at Union of Scientists in Bulgaria, Plovdiv branch and organizing scientific conferences. My personal impressions of his work are that he shows exceptional responsibility towards his work and colleagues. His purposeful work to support the

development of young scientists and the improvement of communication and computer technologies to implement the concepts of sustainability and ecological stability ("Green thinking") show a high commitment to the problems of modern society, which I believe that every teacher should to be sympathetic.

## CONCLUSION

The documents and materials presented by Assoc. Prof. Eng. Dimitar Mihailov Tokmakov, PhD meet all requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDASRB), the Regulations for the Implementation of LDASRB and the relevant Regulations of PU "Paisii" Hilendarski".

The candidate in the competition has submitted a sufficient number of scientific works published after the materials used in the defense of PhD dissertation and not used in the competition for the academic position "Associate professor". The candidate's works contain original scientific and scientific-applied contributions that have received international recognition. His theoretical developments have practical applicability, and some of them are directly oriented to the educational process. The scientific and teaching qualifications of Assoc. Prof. Eng. Dimitar Tokmakov, PhD meet the requirements of the competition. The results achieved by Assoc. Prof. Dimitar Tokmakov, PhD in the educational and research activities correspond to the minimum national and additional requirements of the Faculty of Physics and Technology, adopted in connection with the Regulations of the PU for the application of LDASRB.

After getting acquainted with the materials and scientific works presented in the competition, analyzing their significance and the contributions contained in them, I find it is reasonable to give my positive assessment and to confidently recommend to the Scientific Jury to prepare a report-proposal to the Faculty Council of the Faculty of Physics and Technology for the election of **Associate Professor Dimitar Mihailov Tokmakov, Ph.D**, to the academic position of **"Professor"** at PU "Paisii Hilendarski" in: the higher education area : 5. Technical sciences, professional field 5.3. Communication and computer technology (Automation of areas from the intangible sphere - education, science).

06.04.2023

Reviewer: .....

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