



## OPINION

for holding academic position "Professor"

in a competition announced from the University of Economics - Varna  
by Assoc. Prof. DSc Pavel Stoyanov Petrov, University of Economics - Varna,  
Faculty of Informatics, Department of Informatics

### 1. General information

The opinion was prepared by Assoc. Prof. DSc Pavel Stoyanov Petrov, PF 4.6. "Informatics and Computer Science", based on the Law on the Development of Academic Staff in the Republic of Bulgaria (LDASB), Rules for Implementation of the Law on the Development of Academic Staff in the Republic of Bulgaria (RILDASB), Rules for Development of Academic Staff at University of Economics - Varna (RDASUEV), Order of the Rector UE-Varna № RD 06-156/20.09.2022 and Decision of the Scientific Jury of 29.09.2022.

### 2. Data for the competition

The competition for the academic position of "Professor" in a professional field (PF) 4.6. "Informatics and Computer Science", scientific specialty "Informatics", was published in the State Gazette, issue 57/22.07.2022 for the needs of the Department of Informatics.

### 3. Candidate for the competition

The only candidate in the competition for the academic position of "Professor" is Assoc. Prof. Dr. Silvia Stoyanova Parusheva, lecturer at the University of Economics - Varna, Faculty of Informatics, Department of Informatics. She completed her secondary education at First Language High School - Varna in 1984. Graduated from the University of Economics - Varna in 1989, after which she worked in practice as a programmer of application systems and a specialist in general banking operations. After studying in a full-time doctorate, in 2001 she obtained the educational and scientific degree "Doctor" in the scientific specialty "Statistics and Demography", defending a

dissertation on the topic "Econometric study of the average yield of short-term government securities in the Republic of Bulgaria". Since 2001 she has been working as a chief assistant in the Department of Informatics at the University of Economics - Varna. Since 2012 she is Associate Professor in the professional field 4.6 "Informatics and Computer Science".

Simultaneously with the successful teaching activity, Assoc. Prof. Dr. Silvia Parusheva participated in 12 projects, including 1 international, leader of 5 of them: researcher in project BG05M2OP001-1.002-0002-C02 "Digitalization of the economy in a Big Data environment (DIGD)" (2018-2023); participation in the project BG05M2OP001-2.013-0001 "Student Internships - Phase 2", within the Operational Program "Science and Education for Smart Growth"; head of a project to support the development of the empirical part of Anna Timofeeva's doctoral dissertation No. NPD 261 of 2019, 2019-2020; head of a project to support the development of the empirical part of the doctoral dissertation of Daniela Pencheva No NPD 286 of 2020, 2020-2021; head of research project NP-13/2017 "Social media in business and education - innovative models, opportunities and challenges", 2017-2018; participation in research project NP-9/2017 "Investigation of the application of mobile and web technologies in publicly available services offered by the banking sector in EU countries - 2017-2019", 2017-2018; participation in an international Horizon 2020 project "A FINancial supervision and TECHnology compliance training program (FIN-TECH) - Call: Horizon 2020-ICT-2018-2020; participation in project BG051PO001-4.3.04-0036 "Distance learning - a modern approach in the system of academic education to improve the quality of human resources", 2013-2014; participation in research project No. BG05M2OP001-2.016-0002 "Modernization of higher education to achieve interdisciplinary and innovative learning in the conditions of digital transformation", EDUTransform, 2021-2023; participation in project BG051PO001-3.1.09-0018 "Building a sustainable system for increasing the competences and career growth of the academic staff of IU-Varna", financed under the OP "Development of human resources", 2013-2014; participation in the project "Strategy for ensuring safety and protection of virtual web systems in banking", 2008-2010; participation in the project "Career Development for All" under the Operational Program "Development of Human

Resources" with the financial support of the EU through the European Social Fund, 2007-2013.

#### **4. Quantitative and substantive characteristics of the submitted scientific papers after the last procedure**

For the participation in the competition for the academic position "Professor" Assoc. Prof. Dr. Silvia Stoyanova Parusheva presents a total of 66 publications, with a total volume of 1547 pages:

- monographs and chapters from books - 2;
- studios - 4;
- scientific articles - 16;
- scientific reports - 31;
- textbooks and teaching aids - 12.

The presented monographic work "Methods of Authentication for Protection of Individual Users of Internet Banking" with a volume of 169 standard typewritten pages meets the requirements of Article 62, item 3 and Article 71, paragraph 2 of the Regulations for the development of academic staff in University of Economics - Varna, as the published monograph does not repeat publications for obtaining the educational and scientific degree "Doctor", is published in a specialized scientific publishing house, discussed in a specialized primary unit within the meaning of §1, item 6 of LDASB and is peer-reviewed by two habilitated persons.

The monographic work of Assoc. Prof. Dr. Silvia Parusheva is an in-depth study of a current scientific and applied problem at a high modern level. It proposes a methodology for the selection and implementation by banks of multi-factor authentication schemes, which allows countering the dangers inherent in online banking systems and endangering their users. A study was made of the state of authentication of individual Internet banking users, which is applied by the banks operating in the Bulgarian banking market. The range of dangers specific to online banking systems and their users has been explored in the following areas: threats against the devices used by users, threats against communication networks and identity theft. Various methods of authenticating internet banking users are reviewed and compared.

From this point of view, the possibilities for improving the authentication schemes applied by the banks to the online banking users have been examined, the necessity has been pointed out and a short but clear methodology has been proposed for the selection and implementation by the banks of multi-factor authentication schemes. The proposed short methodology is accompanied by more detailed methodological notes to be used when implementing the proposed methodology for reliable authentication of online banking users.

Several recommendations are given to the banks regarding the applied authentication schemes and an example scenario for a real practical application of a methodology for selecting and implementing a two-factor authentication scheme is considered.

The other scientific publications submitted for participation in the competition, also meet the requirements. Most of them are in English and have been published in authoritative Bulgarian and foreign scientific journals, referenced and indexed in world-famous databases with scientific information such as Scopus and Web of Science.

The attached references show that 261 citations of scientific publications were found, including 70 citations in Scopus and Web of Science.

In its entirety, the presented publications fully cover the minimum national requirements set in the LDASB, RILDASB, as well as the internal requirements set in the RDASUEV (Art. 77, items 3, 4, 5 and 6 in connection with Art. 86) for holding an academic position "Professor" in PF 4.6. Informatics and Computer Science. They enrich the existing theoretical knowledge and are applicable in practice.

## **5. Quantitative and qualitative evaluation of the teaching work**

Assoc. Prof. Dr. Silvia Parusheva has held over 21 years academic positions "Chief Assistant" and "Associate Professor" - the last position was held over 12 years at the University of Economics - Varna, which meets the requirements of Art. 77, item 2 in connection with Art. 86 of the Regulations for the development of the academic staff at the University of Economics - Varna. In addition, there are mobilities for teaching under the Erasmus+ program - Bonn-Rhein-Sieg University of Applied Sciences, Germany (2009), Sapienza

University, Italy (2017). Her teaching activity covers and corresponds to the field in which the competition was announced, and shows the presence of extensive teaching experience and competence.

Assoc. Prof. Dr. Silvia Parusheva has participated in the creation of a number of lecture courses - 17 for Bachelor's degree, 10 for Master's degree and 4 for Doctor's degree. She has given lectures and exercises in a number of disciplines related to the announced competition:

- For Bachelor's degree: Informatics, Cloud Technologies, Information Systems Security Planning and Management, Information Systems Fundamentals, E-Business (English), Academic Research, Information and Communication Technologies in the Financial Sector, E-Business Strategies, Financial Software, Statistical Databases, Modern Information Communications, Internet Business Applications, UNIX Operating Systems, Operating Systems.

- For Master's Degree: Cyber Security, E-Business, Fundamentals of Information Systems, Cloud Technologies, E-Finance (English), E-Business Part 2, E-Business Part 2 (English), Information Systems and E-Business.

- For Erasmus students: E-business.

The published teaching materials are textbooks and teaching aids in certain disciplines, as well as methodological manuals - a total of 12, of which 11 co-authored and 1 independently.

She works together with students and PhD students in 6 projects: Project BG05M2OP001-2.013-0001 "Student internships - Phase 2"; period 2020-2021; NPD 261/2019; NPD 286/2020; NPI 13/2017; NPI 9/2017; Project No. BG05M2OP001-2.016-0002 "Modernization of higher education to achieve interdisciplinary and innovative learning in the conditions of digital transformation", EDUTransform, 2021-2023.

Assoc. Prof. Dr. Silvia Parusheva has supervised: 1 PhD student who successfully defended the "Doctor" degree; 3 doctoral students dismissed with the right of defense within a period of 5 years, with expired right of defense and partial scientific supervision; and 1 currently under supervision. She has led 11 bachelor's and 15 master's degrees theses.

## **6. Identification of scientific contributions**

In the works with which Assoc. Prof. Dr. Silvia Parusheva participates in the competition for the academic position "Professor" in PF 4.6 "Informatics and Computer Science", 10 contributions can be highlighted, described in the Reference for Scientific and Applied Contributions. I accept the contributions as significant, real and enriching the existing theory and practice. I believe that they can be defined as contributions of a scientific and scientific-applied nature.

### **7. Critical remarks and recommendations**

I believe that Assoc. Prof. Dr. Silvia Parusheva has scientific and teaching potential. I recommend:

- To continue the work on publications, indexed and referenced in world-famous databases with scientific information;
- To continue to work actively with students and PhD students on projects.

### **8. Conclusion**

Based on the above, it is evident that the candidate has significant experience in research and teaching activities in the scientific field of the announced competition and fully meets the requirements set out in LDASB, RILDASB and RDASUEV. This gives me reason to give a positive assessment of the candidacy of Assoc. Prof. Dr. Silvia Stoyanova Parusheva to hold the academic position of "Professor" in the professional field 4.6. "Informatics and Computer Science".

Date: 20.10.2022

Member of the jury: .....

/ Assoc. Prof. DSc Pavel Petrov /

Заличена информация съгласно  
ЗЗЛД и регламент (ЕС) 2016/ 679

Full Prof. Borislav Stoyanov PhD, DSci

University of Shumen, Bulgaria

## OPINION

of the documents submitted for participation in the competition for the academic position "Full Professor" announced by the University of Economics - Varna in the field of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.6. Informatics and Computer Science, and the scientific specialty Informatics, for the needs of the Department of Informatics of the University of Economics - Varna (the competition was published in the State Gazette No. 57 / 22.07.2022).

### 1. General information

By order RD 06-156 / 20.09.2022 of the Vice-Rector for R&D of the University of Economics - Varna, I have been appointed a member of the scientific jury under this procedure. At the first meeting of the scientific jury (September 29, 2022) I was appointed to write opinion on the submitted documents.

### 2. Candidate for the competition

Associate Professor Dr. Silvia Stoyanova Parusheva is the only candidate for this academic position. She has been working at IU-Varna, Department of Informatics as a chief assistant since 2001, and as an associate professor in 4.6. Informatics and Computer Science since 2010. Assoc. Prof. Parusheva is a PhD in scientific specialty 05.02.06 Statistics and Demography, with the topic of the dissertation Econometric study of the average yield of short-term government securities in the

Republic of Bulgaria (Problems, analyzes and models). In the Register of Scientific Activity in the Republic of Bulgaria it is numbered 27412.

3. Quantitative and substantive characteristics of the presented scientific papers under the procedure.

I received a set of electronic versions of all documents related to the procedure. All documents are in accordance with the Regulations of the University of Economics - Varna.

To participate in the competition for full professor, the candidate presented a habilitation monograph Authentication method for the protection of individual Internet banking users and chapter of the monograph Strategies for digitization in the fields of "Real Estate Management" and "Construction Economics". According to the reference for satisfying the minimum national requirements under indicator D.3 23 publications were presented, and 70 citations were proposed under indicator D.

In the main habilitation work, methodology and methodological notes are proposed for the selection and implementation of schemes for reliable multi-factor authentication of users of banking institutions. This allows the provision of opportunities to improve the authentication schemes applied by banks to their customers in online banking. In this way, one can contribute to increasing the security of the electronic banking service.

The remaining publications of the candidate are related to a methodology for a comprehensive quantitative assessment of biometric characteristics for selecting the most suitable of them for inclusion in biometric authentication systems in online banking, a study of the degree of adoption of Internet banking (Internet banking adoption - IBA) among young people Bulgarians, developing a web-based ontology for the e-business paradigm, researching the possibilities of social



networks, researching the processes of digitization in construction, examining the effective organization of the information systems of small and medium-sized enterprises by using the outsourcing of data processing services (for example, work salary - Payroll services) etc.

In addition to the procedure materials, Prof. Parusheva presented co-authorship in eleven textbooks and teaching aids and one independent teaching aid - Financial calculations and analyzes with MS Excel from 2015.

#### 4. Quantitative and qualitative evaluation of the teaching work

Assoc. Prof. Parusheva conducts classes (lectures and exercises) with students from IU-Varna in the following academic disciplines: Operating Systems, UNIX Operating Systems, Fundamentals of Information Systems, Information Systems Security Planning and Management, Cloud Technologies, Academic Research, Informatics, Cybersecurity and E-business (English language), etc. I find her teaching work quite varied and giving her insight into various areas of informatics and computer science.

#### 5. Identification of contributions to research work. Evaluation of the candidate's citations

- A methodology has been developed for the selection and implementation of a multi-factor identification scheme. It includes the relevant stages in the implementation of the scheme, starting from the initial steps of risk assessment to the final steps in the stage of exploitation of the authentication scheme, when it is necessary to apply and a corresponding audit in order to obtain independent evidence of the maintained good level of authentication;

- The possibilities for the application of social media in business have been researched and analyzed - mainly in the banking sphere, and also in the field of smart city management;

- An intelligent approach has been proposed for the prevention of card fraud with the use of intelligent methods;

- Approaches are proposed for performing a comparative analysis in researching the user experience, experience and perception of the user interface of the e-learning platforms and tools MS Teams, Google Meet and Moodle by students.

In addition, data on 261 open citations of the candidate's scientific publications are presented. I single out the papers Social media usage patterns in higher education institutions - An empirical study and Use of social media in higher education institutions - an empirical study based on Bulgarian learning experience, which each have 16 citations in Scopus.

As a result of the above, I believe that Assoc. Prof. Parusheva's scientific research has sufficient prominence in scientific circles. Among the scientific works, I did not find any plagiarism and unauthorized use of foreign texts.

The candidate has taken part in the development of numerous curricula. Assoc. Prof. Parusheva is the leader of 3 projects and participates in another twelve. There are three participations in the Erasmus+ program.

Under her supervision, 26 bachelor's and master's degree theses were completed. Assoc. Prof. Parusheva has three doctoral students supervised and assigned with the right to defense, one of them has already obtained the PhD. He is currently supervising a PhD student again.

## 6. Critical remarks and recommendations

I recommend that the candidate focus her efforts on continuing to publish articles in journals with an impact factor and continue her successful work with young scientists and postdocs.

### Conclusion

Based on my acquaintance with the submitted documents on the competition procedure and analysis of their significance, I see that the candidate meets the minimum national requirements and rules for the conditions and procedure for holding the academic position of "Full Professor". I give my positive assessment of the choice of Assoc. Professor Dr. Silvia Stoyanova Parusheva in the academic position of "Full Professor" at the University of Economics - Varna in the field of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.6. Informatics and computer science, and scientific specialty Informatics.

Shumen

2022/10/23

Signature: .....

(Full Prof. Borislav Stoyanov, PhD, DSci)

Заличена информация съгласно  
ЗЗЛД и регламент (ЕС) 2016/ 679



**OPINION**

**by a member of the scientific jury for the academic position “Professor”  
in a competition announced by the University of Economics – Varna**

**1. General information**

The review was prepared by: Prof. Evdokia Nikolaeva Sotirova, PhD University “Prof. Dr. A. Zlatarov” – Burgas.

Grounds for writing an opinion for the competition: Order № RD 06-156/20.09.2022 of the Rector of the University of Economics – Varna from 06.12.2021 for the appointment of a scientific jury and a decision from the first meeting of the scientific jury on 17.12.2021.

This opinion has been prepared in accordance with the Law for the development of the academic staff in the Republic of Bulgaria (ZRASRB), the Rules for the Implementation of ZRASRB and the Rules for the Development of the Academic Staff at the University of Economics – Varna.

**2. Information about the competition**

The competition is announced in the field of higher education: 4. Natural sciences, mathematics and informatics in the professional field 4.6. “Informatics and Computer Science”, scientific specialty “Informatics”, for the needs of the Department of Informatics, Faculty of Informatics at the University of Economics – Varna.

Number and date of the State Gazette in which the respective announcement was published: 57/22.07.2022.

The presented set of materials and documents for participation in the competition is in accordance with Art. 80. (1) of the Regulations for the development of the academic staff at the University of Economics – Varna.

**3. Candidates in the competition**

The only candidate in the competition for the academic position of “professor” is Assoc. Prof. Silvia Stoyanova Parusheva, PhD.

Assoc. Prof. Silvia Stoyanova Parusheva, PhD was born in 1984 in the town of Varna. She graduated high school in 1989 at the First Language High School in the city of Varna.. In 1989, she completed a master's degree in economics with a specialization in Socio-Economic Information at the University of Economics – Varna. In 2001 she obtained the educational and scientific degree “Doctor” in the scientific specialty “Statistics and Demography” for a defended



dissertation on the topic „Econometric study of the average yield of short-term government securities in the Republic of Bulgaria (Problems, analyzes and models)”.

The work experience of the candidate began with her being a programmer (1989 - 1994). In the period 2001-2010, Prof. Parusheva was the main assistant, and from 2010 until now she holds the academic position of „associate professor” in the scientific specialty „Application of computing technology in the economy (Informatics) in the Department of Informatics, Faculty of Informatics”, Varna University of Economics.

The total number of publications of Assoc. Prof. Silvia Parusheva is 93, of which 3 are monographs (1 independent, 2 co-authored); 6 extended articles (4 independent, 2 co-authored); 26 articles in magazines and periodical issues (15 independent, 11 co-authored); 40 papers in conference proceedings (14 independent, 26 co-authored). 34 of these are independent, which shows that the scientific achievements of the candidate are largely her personal work. 23 of the publications were indexed in Scopus/WoS, and 70 citations were observed. All the candidate's works are in editions included in the national reference list maintained by the National Center for Information and Documentation. Assoc. Prof. Silvia Parusheva is author or co-author of 15 textbooks (3 independent, 12 co-authored), and 2 practical textbooks (co-authored). She has worked on 12 research projects, leading 3 of them. She was involved in the organization of a number of activities related to students and doctoral students. She supervised 5 doctoral students, one of whom successfully defended his dissertation. She participated in the Erasmus+ program for the purpose of teaching.

#### **4. Quantitative and substantive characteristics of the submitted scientific papers after the last procedure**

Assoc. Prof. Silvia Parusheva is participating in the competition with 53 scientific publications, 10 textbooks and 2 practical textbooks.

The scientific publications, are distributed as follows:

- 1 monograph (habilitation monograph), 1 co-authored collective monograph,
- 23 publications indexed in Publications in Scopus and/or Web of Science (3 independent and 20 co-authored), of which 3 studies (2 independent and 1 co-authored),
- 12 scientific articles (5 independent and 7 co-authored),
- 17 scientific papers in conference proceedings (6 independent and 11 co-authored).

The scientific papers submitted for participation in the competition have not been used to obtain the educational and scientific degree “Doctor” and to hold the academic position of “Associate Professor”, no plagiarism has been detected and all are reviewed.



**4.1. Fulfillment of the national requirements for holding the academic position "professor" in the professional field 4.6. Informatics and computer science**

According to the Information attached by Assoc. prof. Silvia Parusheva for fulfillment of the minimum national requirements for holding the academic position "Professor" in the field of higher education 4. "Natural Sciences, Mathematics and Informatics", she is participating in the competition with 25 scientific publications with a total volume of 412 typewritten pages. They are as follows:

- 1 monograph (habilitation monograph) (169 typewritten pages);
- 23 scientific publications in issues referenced and indexed in Web of Science or Scopus (198 typewritten pages), all with SJR-factor. 2 of the publications are in quartile Q2 [7, 23], 4 in quartile Q3 [1, 2, 3, 4], 4 are in quartile Q4 [5, 6, 17, 19]. 3 of the publications are independent;
- 1 collective monograph (participation of the candidate with 45 typewritten pages).

All presented scientific works are directly related to the theme of the competition.

The monograph of the Assoc. prof. Silvia Parusheva is entitled "Authentication Methods to Protect Individual Internet Banking Users". In accordance with the Regulations for the development of the academic staff at the University of Economics - Varna, it was discussed at a meeting of the "Informatics" department, it was reviewed by two qualified persons, and it was published in the specialized scientific publishing house "Science and Economics", University of Economics - Varna. The monograph examines and analyzes the practices of banking institutions regarding authentication methods applied to the Bulgarian banking market for the purpose of security in online banking. A methodology for the selection and implementation by banks of multi-factor authentication schemes has been developed and recommendations have been made to banks to improve the degree of protection of individual users. The content is very well structured, competently presented and well-illustrated. According to *Group of indicators B*, the candidate has 100 points.

The subject represented in the scientific production provided by the candidate for participation in the competition is diverse and current. Researching opportunities for the use of social media in business, in education, the application of intelligent approaches to the protection of personal data in Internet banking are definitely of high level of utility. According to *Group of indicators G*, the candidate has 863 points with a minimum requirement of at least 200 points.

According to the attached reference, Assoc. prof. Silvia Parusheva participates in the competition with 70 citations of 13 of her publications in scientific works of other authors, indexed in the world-famous databases with scientific information. According to *Group of indicators D*, the candidate has 560 points with a minimum requirement of at least 100 points.



Assoc. prof. Parusheva supervised 1 PhD student who have successfully earned PhDs in the „Application of computing technology in economics” program. The candidate's activity in project activity is serious - participation in 8 national and 1 international scientific projects, management of 3 national projects. To participate in the competition, the candidate submitted another 10 textbooks (co-authored) and 2 study aids (1 independently, 1 co-authored). According to *Group of indicators E*, the candidate has 352.6 points with a minimum requirement of at least 100 points.

With a total number of 1925.6 reached, it is evident that Assoc. prof. Silvia Parusheva fully satisfies and significantly exceeds the minimum national requirements for occupying the academic position „professor” in professional direction 4.6. Informatics and computer science in groups of *G, D* and *E*.

**4.2. Fulfillment of the requirements for holding the academic position “professor” in the professional field 4.6. Informatics and computer sciences according to art. 77, item 5 of PRAS in the University of Economics – Varna**

According to the attached Certificate – Declaration for holding the academic position “Professor” in the field of higher education 4. “Natural Sciences, Mathematics and Informatics” at the University of Economics – Varna (in effect from 01.07.2021) Assoc. prof. Silvia Parusheva has presented the following for participation in the competition:

- 12 scientific papers with 124 points in this section (60 required);
- 23 scientific articles and extended articles with 336,1 points in this section (with a minimum requirement of 115 points). The requirement for at least one extended article is also met;
- 11 publications in Scopus and/or Web of Science, for which she earns 240 points in this section (with a minimum requirement of 30 points);
- 70 citations in Scopus and/or Web of Science, with which she earns 1050 points in this section (with a minimum requirement of 15 points);
- 1 defended PhD student, which gives her 40 points in this section (with a minimum requirement of 40 points);
- 12 participations in national scientific or educational projects; she has been the leader of 3 national scientific or educational projects with which the participant earns 230 points in this section (with a minimum requirement of 15 points).

The requirements for holding the academic position of “professor” in the field of higher education 4 in University of Economics – Varna have been fully met.

**5. Quantitative and qualitative evaluation of the teaching activity**



From the presented *Documents about the work load* it is evident that Assoc. prof. Silvia Parusheva fulfills the quantitative indicators for the teaching activity. Her teaching experience is serious. Associate Professor Silvia Parusheva teaches the following 23 academic disciplines:

- 14 disciplines of students in the OCS "Bachelor", 1 of which in English: Informatics, Cloud technologies, Planning and security management in information systems, Fundamentals of information systems, E-business (English language), Academic research, Information and communication technologies in the financial sector, E-business strategies, Financial software, Statistical databases, Modern information communications, Internet business applications, UNIX operating systems, Operating systems;
- 8 disciplines in OCS "Master", 2 of which in English: Informatics, Cloud technologies, Planning and security management in information systems, Fundamentals of information systems, E-business (English language), Academic research, Information and communication technologies in the financial sector, E-Business Strategies, Financial Software, Statistical Databases, Modern Information Communications, Internet Business Applications, UNIX Operating Systems, Operating Systems;
- 1 discipline of Erasmus students: E-business.

The above proves the serious teaching and learning activity of Assoc. prof. Parusheva. In parallel, she actively works with students and doctoral students on scientific research projects, participates in doctoral examination committees, provides scientific guidance and reviews diploma and course theses.

The candidate for the competition has the necessary teaching experience and degree of preparation for occupying the academic position of „professor“.

#### **6. Identification of the contributions of the research work**

The contributions of Assoc. Prof. Silvia Parusheva can be distinguished mainly as scientific-applied and applied.

Assoc. prof. Silvia Parusheva's interests related to e-business and e-commerce, application of information and communication technologies in the financial sector, security, social networks and social applications, cloud computing, information systems are represented in a large part of her publications regarding both the quantitative indicators, as well as the significance of the achieved results.

The developed textbooks and teaching aids can be defined as applied contributions.

The candidate's publications have been reflected in scientific works of other authors, indexed in the world-famous databases of scientific information, which shows that the obtained results are of high scientific value.





The research presented and the results obtained prove that Assoc. prof. Silvia Parushēva possesses the necessary theoretical, methodical and practical skills for the development of research activities and knows how to work in a team.

### **7. Critical remarks and recommendations**

I have no significant critical remarks about the candidate in the contest. Referring to the scientific competences and rich educational and teaching activities of Associate Professor Silvia Parusheva, I believe that it will be useful to work more actively with young researchers and doctoral students.

### **8. Conclusion**

After getting acquainted with the materials and scientific papers provided by Assoc. Prof. Silvia Stoyanova Parusheva, PhD, I confirm the compliance of the candidate's results with the requirements of ZRASRB, the Regulations for the implementation of ZRASRB and the Regulations for the Development of the Academic Staff at the University of Economics – Varna for the academic position “Professor” in the professional field 4.6. Informatics and Computer Science. The candidate significantly exceeds the minimum national requirements in the professional field, as well as the additional requirements of the University of Economics – Varna.

Based on the above, I give a **positive assessment** of the candidacy of Assoc. Prof. Silvia Stoyanova Parusheva, PhD.

**I recommend** to the scientific jury to propose to the Faculty Council of the Faculty of Informatics at the University of Economics – Varna **to select Assoc. Prof. Silvia Stoyanova Parusheva, PhD to take the academic position of “Professor” in the field of higher education: 4. Natural Sciences, Mathematics and Informatics, professional field 4.6. Informatics and computer science, scientific specialty “Informatics”.**

25.10.2022

Burgas

Prepared the opinion: .....

(Prof. E. Sotirova)

Заличена информация съгласно  
ЗЗЛД и регламент (ЕС) 2016/ 679

**OPINION**

**by Prof. Snezhana Dineva Sulova, PhD,  
department of Informatics, University of Economics – Varna,  
member of a scientific jury for the academic position “professor”,  
field of higher education 4. “Natural sciences, mathematics and informatics”,  
professional field: 4.6 “Informatics and computer sciences”**

**1. General information**

The opinion was prepared by Prof. Snezhana Dineva Sulova, PhD, professional field 4.6. “Informatics and Computer Sciences”, member of the scientific jury, determined by order of the Vice-Rector for Research and Professional Development of the University of Economics – Varna № RD 06-156/20.09.2022, Decision of the Scientific Jury dated 27.09.2022, the Law for the development of the academic staff in the Republic of Bulgaria (ZRASRB), Regulations for the implementation of the Law for the Development of the Academic Staff in the Republic of Bulgaria (PPZRASRB) and Regulations for the Development of the Academic Staff at the University of Economics – Varna (PRASUE) .

**2. Data about the competition**

The competition is for the occupation of the academic position “professor” in professional field 4.6 “Informatics and Computer Sciences” (Informatics), for the needs of the department of “Informatics” of the University of Economics – Varna. The competition was announced in the State Gazette issue № 57/22.07.2022.

**3. Contest candidate**

The only candidate in the competition is: **Associate Professor Silvia Stoyanova Parusheva, PhD.**

The candidate graduated with a master’s degree in “Economist in Socio-Economic Information” at the University of Economics – Varna. In 2001, she obtained the educational and scientific degree “doctor” in the scientific specialty “Statistics and Demography” from the Higher Attestation Commission for a defended dissertation on the topic “Econometric study of the average yield of short-term securities in the Republic of Bulgaria (Problems, analyses and models)”. Since 2001, the candidate has held the position of “chief assistant professor”, and since 2010, the position of

“associate professor” in the “Informatics” department of University of economics – Varna. She had previously worked as a general banking operations specialist and application systems programmer.

Associate Professor Silvia Parusheva, PhD has extensive experience in teaching and research. She has participated in scientific juries, editorial boards of journals, program and organizational committees of conferences. She is the director of the Center for Electronic and Distance Learning at the University of economics – Varna.

#### **4. Quantitative and qualitative characteristics of the presented scientific works**

The candidate is participating in the competition for the academic position of “professor” with 66 publications, distributed as follows:

- 1 monograph (habilitation thesis);
- 1 collective monograph;
- 4 studies (2 independent and 2 co-authored);
- 16 research articles (6 independent and 10 co-authored);
- 31 research papers (6 independent and 25 co-authored);
- 12 textbooks and practical textbooks;
- 1 other publication.

According to Art. 60 item 3 of PPZRASRB and art. 77 item 3 of PRASUE, the candidate has submitted a published monographic work in a specialized scientific publication, which does not repeat published scientific works, for acquiring the educational and scientific degree “doctor” and for occupying the academic position “associate professor”. The paper was discussed in the Department of Informatics and was reviewed by two professors.

The title of the monographic paper is “Authentication Methods for the protection of individual users of internet banking“, its volume is 169 standard pages. The monograph is an in-depth study and it is devoted to an important issue. The author, based on an analysis of banking institutions, offers a methodology and methodological notes for the selection and implementation of schemes for reliable multi-factor authentication of individual users of online banking. The methodology has been tested in a banking institution.

The habilitation work, as well as all scientific publications of the candidate, are thematically related to the professional field 4.6 Informatics and computer sciences. The works with which assoc. prof. Parusheva, PhD participates in the competition do not repeat the publications presented for the acquiring of the educational and scientific degree “doctor” and for the occupation of the academic position “associate professor”. Most of the publications are in English and are referenced and indexed in world-renowned databases of scientific information. From the references for the 261 citations found, it can be seen that assoc. prof. Parusheva is well-known in scientific circles.

After I got acquainted with the publications submitted by the candidate for the contest, I believe that they are her work, no plagiarism has been detected.

The fulfillment of the minimum national requirements for the groups of indicators for occupying the academic position “professor” is as follows:

- for indicator group “A” – the candidate has a defended dissertation for awarding the educational and scientific degree “doctor”, diploma № 27317 /13.06.2001. (50 points);
- for indicator group “B” – a habilitation thesis monograph published in Monograph Library “Prof. Tsani Kalyandzhiev”, vol. 71, ISBN 978-954-21-1068-2, in 2021 (100 points);
- for indicator group “C” – a total of 23 scientific publications are presented in issues that are referenced and indexed in world-renowned databases with scientific information (Scopus or Web of Science), as well as parts of a collective monograph. The applicant’s scores significantly exceed the required 200 points on this metric.
- for indicator group “D” – a total of 70 citations are presented in Scopus and Web of Science, each of which brings 8 points to the candidate, according to this indicator the points are also sufficient;
- for indicator group “E” – the candidate has supervised one successfully defended doctoral student (50 points), has participated in 8 national projects, 1 international one and has supervised 3 scientific projects (160 points). In addition, a list of 12 published textbooks and practical textbooks is presented (142.6 points). In total, the points for this indicator are sufficient.

According to the Reference-declaration for occupying the academic position of “professor” in the field of higher education 4. “Natural Sciences, Mathematics and Informatics” at University of economics –Varna assoc. prof. Silvia Parusheva, PhD fully satisfies the requirements under Art. 77, item 5 of PRASUE.

### **5. General assessment of teaching work**

Assoc. prof. Silvia Parusheva, PhD has 21 years of teaching experience in the “Informatics” department of University of economics –Varna. To bachelor’s degree students she has taught the disciplines: Informatics, Cloud technologies, Planning and security management in information systems, Fundamentals of information systems, E-business (in English), Academic research, Information and communication technologies in the financial sector, Strategies for e-business, Financial software, Statistical databases, Modern information communications, Internet business applications, UNIX operating systems, Operating systems; to master’s degree students –Cybersecurity, Electronic business, Fundamentals of information systems, Cloud technologies, E-finance (in English), E-business part 2, E-business part 2 (in English), Information systems and e-business; to Erasmus students: E- business.

She has published 12 textbooks and practical textbooks. She has participated in the development of 17 study programs for the bachelor’s degree, 10 for the master’s degree, and 4 doctoral programs. She works actively with students and PhD students on research projects. She participates in doctoral examination committees, provides scientific guidance and reviews theses and term papers. In the period 2010-2022, assoc. prof. Parusheva was the supervisor of 26 bachelor’s and master’s theses. She worked together with students and doctoral students on 8 scientific projects.

Assoc. prof. Parusheva supervised five doctoral students, incl. one who successfully defended his doctoral degree in the “Application of computing technology in economics” program. She has carried out teaching mobility for the purpose of teaching under the Erasmus+ program at Bonn-Rhein-Sieg University of Applied Sciences, Germany (2009), Sapienza University, Italy (2017).

I highly value the educational and pedagogical experience of the candidate in the competition for the academic position “professor”.

## **6. Identification of scientific contributions**

The contributions presented by Assoc. prof. Silvia Parusheva, PhD are of a scientific and scientifically applied nature. They are related to improving the authentication process at banking institutions, offering innovative models for using social media tools in business and education, developing digitalization strategies in the field of construction and real estate. I consider the candidate's contributions to be significant, real and enriching the existing theory and practice.

## **7. Critical notes, questions and recommendations**

I recommend assoc. prof. Silvia Parusheva, PhD to continue her active teaching and research activities and to pass on her knowledge and experience to students, doctoral students and young researchers.

## **8. Conclusion**

After familiarizing myself with the materials and scientific works provided by assoc. prof. Silvia Stoyanova Parusheva, analyzing their significance and the contributions contained in them, I confirm the compliance of the candidate's results with the requirements of the ZRASRB, the Regulations for the implementation of the ZRASRB for occupying the academic "professor" position in the professional field 4.6. "Informatics and Computer Sciences", as well as the Regulations for the Development of the Academic Staff at IU – Varna.

**I give my positive opinion on the readiness of the candidate assoc. prof. Silvia Parusheva, PhD to occupy the academic position "professor" in professional field 4.6 "Informatics and computer sciences" at the University of Economics – Varna.**

Date:

31.10.2022

Prepared the opinion: .....

/prof. Snezhana Sulova, PhD/

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