

**REVIEW**  
**on a competition for occupation of the academic position “Professor”**  
**in professional field 4.6 Informatics and Computer Science**  
**(Information Technologies),**  
**announced in State Gazette No. 74 of August 21, 2020**  
**by Sofia University St. Kliment Ohridski (SU),**  
**Faculty of Mathematics and Informatics (FMI)**

This review is prepared by Prof. Dr. Maria Nisheva-Pavlova from Sofia University St. Kliment Ohridski, FMI, as a member of the scientific jury for the competition according to Order No. PД 38-496 / 19.10.2020 of the Rector of SU.

One applicant has submitted documents for participation in the announced competition: Dr. Eliza Petrova Stefanova, Associate Professor at FMI, SU.

**1. General description of the materials presented**

The documents of the applicant comply with the requirements of the Act of the Development of the Academic Personnel of the Republic of Bulgaria (ADAPRB), the Rules for the Implementation of the Act of the Development of the Academic Personnel of the Republic of Bulgaria (RIADAPRB) and the Rules on the Terms and Conditions for Acquisition of Academic Degrees and Occupation of Academic Positions at SU (RTCAADOAPSU).

The applicant has submitted for the competition:

- Professional autobiography,
- Copy of diploma for higher education,
- Copy of diploma for educational and scientific degree “Doctor”,
- Copy of certificate for occupation of the academic position “Associate Professor”,
- Certificate of internship in the speciality,
- Documents proving the fulfillment of the requirements of Art. 115, para. 1, item 2 of RTCAADOAPSU,
- Lists of publications (list of all publications and list of publications presented at the competition),
- List of publications, presentations, projects and supervision activities, generated by the information system of SU,

- Reference for the fulfillment of the minimum national requirements and the requirements of SU for the professional field 4.6 Informatics and Computer Science,
- List of citations of publications of the applicant,
- Reference for original scientific contributions,
- Reference for the degree of fulfillment of the indicators under Art. 122, para. 2 of RTCAADOAPSU,
- Copies of publications presented at the competition,
- Abstracts of the publications presented at the competition (in Bulgarian and in English),
- Copy of the competition announcement in the State Gazette.

The documents of the applicant have been prepared carefully and in full compliance with the requirements of RTCAADOAPSU.

## **2. Details of the applicant**

The applicant Assoc. Prof. Dr. Eliza Stefanova has a university degree in Informatics, completed in 1991 at Sofia University. In 2012 she received a doctoral degree in Informatics.

Dr. Eliza Stefanova's teaching career began even before she graduated. From 1990 to 1999 she worked as a part-time lecturer at FMI of the academic courses in Operating Systems and Business Telecommunications. From 1989 to 1999 he held various positions at the University Computing Center of SU. In 1999, after winning a competition, she was appointed an Assistant Professor in the Department of Information Technologies at FMI, and since 2014 she has held the academic position of Associate Professor in the same department. Since 2014 she has been the director of the master's program in E-learning at FMI. For half a year in 2015 she was vice-dean of FMI, and since December 2015 she has been vice-rector of Sofia University. In the meantime, she works as an expert in the Ministry of Education and Science.

## **3. General characteristics of the applicant's scientific work and achievements**

The research activities of Assoc. Prof. Dr. Eliza Stefanova and the topics of her scientific works are entirely in the field of competition. She participates in the competition with 21 publications that do not repeat those of the previous procedures for the acquisition of her doctoral degree and for the occupation of the academic position of associate professor.

All scientific papers submitted for participation in the competition are co-authored. I have no doubt about the applicant's significant personal contribution to the collective publications.

There is no proven plagiarism in the scientific works of Assoc. Prof. Dr. Eliza Stefanova.

In accordance with the requirements under Art. 1a, para. 1 of the RIADAPRB, the candidates for an the academic position of professor in professional field 4.6 Informatics and Computer Science must have: 50 points in group of indicators “A”, at least 100 points in group of indicators “B”, at least 200 points in group of indicators “Г”, at least 100 points in group of indicators “Д”, at least 150 points in group of indicators “E”.

RTCAADOAPSU does not define higher additional requirements than those specified in the RIADAPRB.

According to the submitted documents the applicant covers:

- 50 points in group of indicators “A”,
- 222 points in group of indicators “B”,
- 234 points in group of indicators “Г”,
- 304 points in group of indicators “Д”,
- 160 points in group of indicators “E”.

Therefore, the minimum national requirements and the additional requirements under Art. 1a, para. 2 and para. 3 of the RIADAPRB for occupation of the academic position of “Professor” in the professional field 4.6 Informatics and Computer Science have been completely covered and substantially exceeded by Assoc. Prof. Dr. Eliza Stefanova.

#### **4. General characteristics of the applicant's teaching activities**

The teaching activities of Assoc. Prof. Eliza Stefanova are considerable in scope and diverse in content. She has developed the content of a total of seven subjects from the curricula of the BSc programme in Mathematics and Informatics and the MSc programme in E-Learning at FMI. She teaches a number of courses at FMI: Computer Systems and Technologies, Fundamentals of Computer Networks, Computer Networks (Cisco Academy 1), Cisco Academy Workshop 2, Cisco Academy Workshop 3, Cisco Academy Workshop 4, Audio-visual and Information Technologies in Education, Specific Issues of IT Education, Pedagogical Functions of the Interactive Whiteboard, Technologies in Support of Educational Projects, Fundamentals of E-learning, Development of Multimedia Teaching Materials, Object-

oriented Programming and Methods for its Teaching, E-learning Software Systems, Web Design, Multimedia for Advanced, etc.

Dr. Stefanova has developed, constantly enriches and provides her students with a variety of teaching materials in electronic format for all subjects taught by her. She was the scientific supervisor of one successfully defended PhD student, who is currently an associate professor at FMI. She has supervised and continues to work actively with three former PhD students retained the right to defense, and is currently the supervisor of a foreign PhD student. She was the supervisor of 67 successfully defended graduates, with 45 of whom she worked after her habilitation.

##### **5. Substantive analysis of the scientific and applied scientific achievements of the applicant, presented in the materials for participation in the competition**

The scientific papers, presented by Assoc. Prof. Eliza Stefanova for participation in the competition, contain original research results in the field of informatics and information technologies, which can be grouped and summarized as follows:

- *Group 1: Analysis and processing of big datasets.* A new approach for aggregation of data from different e-learning systems has been developed, which supports joint analysis of these data and obtaining complete and accurate statistics for different aspects of the learning process, enabling one to make adequate management decisions aimed at optimizing the learning process and its results. An improved version of this approach is also proposed, based on the introduction of a dynamic database designed to store intermediate results from query execution, which can be used for the purpose of performing additional detailed analyzes on the aggregated data. New services for e-learning systems based on analysis of big datasets have been designed and implemented. A visual query language for the dynamic database and an approach for its implementation are proposed, enabling the construction and execution of intelligent queries without the need for deep knowledge in the field of ICT.
- *Group 2: Application of ICT in education.* A new flexible method for composing software services for end users has been developed, aimed at the specific needs of the educational system. It is a suitable tool for creating software platforms that assist users in integrating and using different software systems and services for their specific purposes. A prototype of a software platform implementing this method has been created. Numerous scenarios related to the application of different approaches, models and devices for virtual reality in

education have been developed and experimented. The most significant skills and competencies of ICT graduates have been identified according to leading professors and business representatives. New methods and forms of training have been proposed in order to achieve the necessary knowledge and skills of ICT specialists in accordance with the modern requirements.

- *Group 3: Models and methods for implementation of inquiry-based learning approaches.* New methods have been proposed for building the necessary competencies of teachers for the application of the so-called inquiry-based learning approach. The key competencies for teachers and the ways for their development are formulated in order to apply the inquiry-based learning approach. A method has been proposed for the development of teachers' research competencies and a platform has been created for the validation of the results obtained in the application of the inquiry-based learning approach. This platform has been put into practice in a number of pilot events. In particular, the validation of a software environment aimed at applying the inquiry-based learning approach, developed in the framework of an international research project, has been successfully carried out.

In my opinion, the aforementioned results characterize the candidate Assoc. Prof. Dr. Eliza Stefanova as a well-established scientist with significant achievements, which give reason to claim that she completely covers the concept of a leading researcher in the field of informatics and information technologies.

The conclusion on the significance of the candidate's research results is confirmed by the fact that a considerable part of them are applied in the development of innovative products to support teaching and learning in various academic courses. On the basis of the models and scenarios proposed by the candidate, a number of academic disciplines for Bachelor's and Master's degrees have been developed and implemented within the FMI's educational activities.

The significance of the applicant's research results is also evidenced by their reflection in the works of other authors. Dr. Eliza Stefanova submitted data for a total of 210 citations of her publications and 38 of them are citations with which she participates in the competition, in articles by other authors that were referenced and indexed in Web of Science or Scopus.

## **6. Critical notes and recommendations**

I have no significant critical comments on the materials in the competition and in particular on the publications of Assoc. Prof. Dr. Eliza Stefanova. I am aware of the fact that serious

research in the scientific field in which she works is generally a collective matter, but I recommend her to aspire in her future work to some single-authored publications, presenting results to which she has a key contribution. It would be good for her future publications to pay more attention in them to the various IT aspects of the concepts, methods and platforms developed.

### **7. Personal impressions of the applicant**

I have excellent personal impressions of the professionalism, thoroughness, original approach, and dedication to work of Assoc. Prof. Eliza Stefanova. I appreciate her collegiality and cooperativeness, her proverbial ability to work, her highly developed sense of responsibility and her ability to bring what she has started to a successful conclusion.

### **8. Conclusion on the application**

Having become acquainted with the materials and scientific works presented in the competition and on the basis of the analysis of their significance and the scientific and applied scientific contributions contained therein, I **confirm** that the academic achievements of the candidate Assoc. Prof. Dr. Eliza Petrova Stefanova meet the requirements of the ADAPRB, the Regulations for its implementation and the corresponding Regulations of SU for the occupation of the academic position of “Professor” in the professional field “Informatics and Computer Science”. In particular, the applicant meets the minimum national requirements in the professional field and no plagiarism has been detected in her scientific papers submitted at the competition.

I give a **positive assessment** of the application of Assoc. Prof. Dr. Eliza Stefanova.

### **GENERAL CONCLUSION**

Based on the above, I **strongly recommend the scientific jury to vote on a proposal to the Council of the Faculty of Mathematics and Informatics of Sofia University St. Kliment Ohridski to select Assoc. Prof. Dr. Eliza Petrova Stefanova for the academic position of “Professor” in the professional field 4.6 Informatics and Computer Science (Information Technologies).**

November 30, 2020

Reviewer: .....

(Prof. Dr. Maria Nisheva-Pavlova)