

REVIEW
on the competition for occupying the academic position of
“Associate Professor”
in Professional field 1.3. Pedagogy of education in...(Mathematics)
for the needs of Sofia University “St. Kliment Ohridski” (SU),
Faculty of Mathematics and Informatics (FMI),
announced in the State Gazette issue 87 of 19.10.2021 and on the web pages of
FMI and SU

The review is prepared by Professor Kosta Andreev Garov, PhD, University of Plovdiv “Paisii Hilendarski”, Plovdiv, as a member of the Scientific Jury in the competition in Professional field 1.3 Pedagogy of education in ... (Mathematics) based on order № ПД-38-592/10.12.2021, issued by the Rector of Sofia University.

To participate in the competition, documents have been submitted by **only one candidate** – Chief Assistant Professor Irina Zdravkova Vutova, PhD, from FMI of SU.

I. General description of the submitted materials

1. Application data

In my capacity as a reviewer, I have received and carried out a verification of all the documents submitted by the candidate for participation in the competition. I have determined the accuracy of the filed administrative documents and scientific publications and their compliance with the Law on the Development of Academic Staff in the Republic of Bulgaria, the Regulations for the Application of the Act for the Development of the Academic Staff in the Republic of Bulgaria, and the Rules on the Conditions and Procedure for Acquiring Science Degrees and Holding Academic Positions in Sofia University “St. Kliment Ohridski”.

To participate in the competition for occupying the academic position of “Associate Professor”, the candidate Chief Assistant Professor Irina Vutova, PhD, has presented a list of 19 scientific papers in total, including 14 publications in Bulgarian and foreign scientific journals and scientific forums, 2 monographs, and 3 studies. In addition, 5 other documents were presented in the form of official notes and certificates from the employer, supporting the achievements of the candidate and the regularity of the competition.

2. Biographical data

Irina Zdravkova Vutova has a solid education in the field of mathematics and informatics. She completed her secondary education at the Mathematical High School in the town of Vratsa. In 1998 she obtained a Master’s degree in Mathematics and Informatics at FMI of SU. In 2000 she successfully completed a Master's degree in Business Administration at the Faculty of Economics and Business Administration at Sofia University.

Irina Vutova’s career began in 1998 as a part-time assistant in the Department of Geometry at FMI of Sofia University. She also worked as a mathematics teacher at the Miguel de Cervantes High School with Spanish Language Teaching in Sofia, the French Language

School “Alphonse de Lamartine” in Sofia, and the Doris Tenedi Language School in Sofia. In February 2015, she was appointed a full-time assistant at the Department of Education in Mathematics and Informatics at the Faculty of Mathematics of Sofia University, where she is still working.

Irina Vutova’s educational qualification and professional realization logically direct her to the development of a dissertation thesis in the field of mathematics teaching methodology. In 2014, she successfully defended her dissertation on “Prognostic and heuristic role of theorems in the school course in mathematics” and obtained the educational and scientific degree “Doctor” in the professional field 1.3. Pedagogy of education in ... (Mathematics).

3. General characteristics of the scientific work and achievements of the candidate

The scientific papers submitted by the candidate for participation in the competition **meet** the minimum national requirements (under Art. 2b, paragraphs 2 and 3 of the Law on the Development of Academic Staff in the Republic of Bulgaria) and respectively of the additional requirements of Sofia University “St. Kliment Ohridski “ for holding the academic position of “Associate Professor” in area in higher education: 1. Educational Sciences of Professional field 1.3. Pedagogy of education in ... (Mathematics). According to indicator **A** of the requirements, with a minimum number of required **50** points, Chief Assistant Professor Irina Vutova, PhD, has **50** points. According to indicator **B**, with a minimum number of required **100** points, the candidate has **100** points. According to indicator **D**, with a minimum number of required **200** points, Chief Assistant Professor Irina Vutova, PhD, has **254.53** points. According to indicator **E**, with a minimum number of required **50** points, Chief Assistant Professor Irina Vutova, PhD, has **100** points.

The scientific work and achievements of the candidate are in the field of methodology of teaching mathematics in secondary and higher education in Bulgaria. The scientific papers submitted by the candidate **do not repeat** those of previous procedures for acquiring a scientific title and academic position. There is **no legally proven plagiarism** in the scientific papers submitted for the competition.

4. Characteristics and evaluation of the teaching activity of the candidate

From the presented documents it can be seen that the entire professional experience of Irina Vutova consists of teaching. She has conducted training in:

- “Analytical Geometry” to students majoring in Mathematics and Informatics, “Applied Mathematics”, and “Statistics”;
- “Linear Algebra and Analytical Geometry” to students majoring in “Physics and Mathematics”;
- “Geometry” to students majoring in “Physics and Mathematics”;
- “Practicum in Mathematics” to students majoring in “Physics and Mathematics”;
- “Methods of teaching mathematics” to students majoring in “Mathematics and Informatics” and “Physics and Mathematics”, facultative module “Teacher of Mathematics”, postgraduate qualification “Teacher of Mathematics”, and “Teacher of Mathematics and Information Technology”;
- “Current pedagogical practice” to students majoring in “Mathematics and Informatics” and “Physics and Mathematics”, facultative module “Teacher of Mathematics”, as well as other academic subjects in FMI and in the high schools where she worked.

The comments for her teaching work are very favourable. They are also confirmed by the fact that Irina Vutova is a regular participant in the expert commissions of the Ministry of Education and Science for external evaluation of the results of students in 7th and 10th grades in mathematics.

5. Scientific and applied scientific achievements of the candidate contained in the materials for participation in the competition

Chief Assistant Professor Irina Vutova, PhD, has identified 10 scientific contributions from her research. The scientific contributions of the research work submitted for the competition are in the field of theory and practice in mathematics education and, in particular, in the teaching of geometry, entertaining mathematics, mathematics in primary school, and history of mathematics. The reviewer acknowledges these contributions and considers that the most significant of them are the following:

- Contribution 1: a general heuristic scheme for formulating new statements (hypotheses) in mathematics courses has been created. The scheme has been successfully tested by vector-algebraic modelling;
- Contribution 2: along with the use of vector-algebraic modelling as a method for solving geometric problems, the possibility of its application as a heuristic approach is shown for “expanding” geometric knowledge by “upgrading” (constructing analogues) of planimetric theorems in 2 spaces with three or more dimensions;
- Contribution 4: the three-dimensional and four-dimensional analogues of the theorems for the face of a triangle and the face of a quadrilateral are formulated and proved and hypotheses for analogues of the same theorems in n -dimensional space are formulated;
- Contribution 7: for the purposes of the mathematical preparation of the students – the future teachers in the primary classes, a concept for modern university education has been developed. The concept promotes the idea that mathematical modelling represents mathematics from its “active” side, which gives us reason to emphasize modelling in student teaching.
- Contribution 9: a new way (MZ-map) is proposed for modelling problem situations related to additive operations (unification, intersection, and addition) with finite sets in primary school mathematics.

The results of the research of Chief Assistant Professor Irina Vutova, PhD, have found a response in the specialized scientific literature – she has presented a list of **23 notable citations** of her publications, **2** of which are in publications referenced in the world-famous **Web of Science** database.

6. Critical remarks and recommendations

I have no critical remarks. The scientific production submitted for participation in the competition does not contain significant weaknesses that would diminish its merits. As a recommendation, I can say that it would be appropriate for the candidate to publish more independent research and possibly have more publications in scientific journals abroad.

7. Personal impressions of the candidate

I do not know the candidate personally and I have no personal impressions of her.

8. Conclusion on the application

After getting acquainted with the materials and scientific papers presented in the competition and based on the analysis of their importance and the scientific and applied scientific contributions contained in them, I **confirm** that the scientific achievements meet the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria, the Regulations for its application and the relevant Rules of Sofia University “St. Kliment Ohridski” for holding the academic position of “Associate Professor” by the candidate in the scientific area and the professional field of the competition. In particular, the candidate **satisfies the minimum** national requirements in the professional field and **no plagiarism has been established** in the scientific papers submitted for the competition.

I give my **positive** assessment of the application.

II. OVERALL CONCLUSION

Based on the above, I **recommend** that the Scientific Jury propose to the competent body from the Faculty of Mathematics and Informatics at Sofia University “St. Kliment Ohridski”, designated for the announced competition, to elect Chief Assistant Professor **Irina Zdravkova Vutova**, PhD, for the academic position of “**Associate Professor**” in professional field 1.3. Pedagogy of education in ... (Mathematics).

22.01.2022

Reviewer:

/Prof. Kosta Garov, PhD/