REVIEW

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On the documents submitted for a participation in the competition for an occupation of the academic position "Professor" at the Faculty of Mathematics and Informatics in University of Plovdiv Paisii Hilendarski on **Research area: 4.** Natural sciences, mathematics and informatics, **Professional field 4.5.** Mathematics (Mathematical analysis), announced in the State Gazette no. 94 of 12.11.2021 and on the web site of the University of Plovdiv Paisii Hilendarski, where Hristo Stefanov Kiskinov , PhD an Assoc.. Prof. from University of Plovdiv Paisii Hilendarski participates as a candidate – **the only one** candidate.

By Order № РД 21-298/10.02.2022 of the Rector of the University of Plovdiv Paisii Hilendarski, I was appointed as a member of the Scientific Jury of the competition for the occupation of the academic position "Associate Professor" in on Research area: 4. Natural sciences, mathematics and informatics, Professional field 4.5. Mathematics (Mathematical analysis).

As a member of the jury I, obliged to write a review, have received all the necessary documents attached to the application of Associate Prof. Hristo Stefanov Kiskinov, PhD to the Rector of the University of Plovdiv Paisii Hilendarski for participation in the competition. The documents are well designed and arranged.

For the participation in the announced competition **just one candidate** (Associate Prof. Hristo Stefanov Kiskinov, PhD) has submitted documents. He has enclosed two reports to satisfy the minimum national requirements and the additional requirements of the Faculty of Mathematics and Informatics (FMI) at Plovdiv University "Paisii Hilendarski" (PU). He is listed in NACID with satisfying the minimal national requirements for the academic position of Associate Prof. (Docent). He has presented his diploma for PhD degree, already obtained in 2012.

The candidate has received his PhD in 2012, thus he satisfies the minimum national requirements and has a score of 50 points for the group of indicators "A".

The candidate has been an associate professor since February 2014. It makes a good impression that the candidate is registered in NACID as an associate professor with scientific-metric indicators

The candidate satisfies the requirement for group of indicators "B" -303 points.

The candidate satisfies the requirement for group of indicators "Г" with 684 points.

It makes a good impression that the candidate has presented: 4 publications with Q1, as all magazines are in the first 7%, 3 with Q2. He has participated in a total of 11 publications with an IF.

Assoc. Prof. Hristo Kiskinov participated with 66 citations in WoS and/or SCOPUS, which satisfies the Law on the Development of the Academic Staff in the Republic of Bulgaria and therefore satisfies the requirement for group of indicators "Д" with 528 points.

According to indicator "E", the candidate participates with 110 points.

The candidate participates with:

24 publications (20 required by the additional requirement of FMI at PU),

24 articles in journals (12 required by the additional requirements of the Faculty of Mathematics and Informatics),

11 publications with IF, (8 required by the additional requirement of FMI at PU),

131 citations (20 required by the additional requirement of the FMI at PU),

1 textbook (1 required by the additional requirements of the FMI at PU),

Assoc. Prof. Kiskinov is the scientific supervisor of 1 successfully finished PhD student in FMI at PU

This short and formal review shows that all minimum national requirements and the additional requirements of the Faculty of Mathematics and Informatics are met.

GENERAL CHARACTERISTICS OF CANDIDATE ACTIVITIES

EVALUATION OF EDUCATIONAL AND PEDAGOGICAL ACTIVITY

Assoc. Prof. Hristo Stefanov Kiskinov, PhD was born in 1963. He graduated successively Mathematical School "Acad. Kiril Popov", Plovdiv, Plovdiv University" Paisii Hilendarski ", Faculty of Mathematics and Informatics with a 5-year course of full-time study in Mathematics and Informatics, which equates to a master's degree and obtained the PhD degree in 2012 in Plovdiv Paisii Hilendarski University. He has been working as an assistant, senior assistant, chief assistant and associate professor since 1989.

I have known the candidate personally since 1999, when I started working at the FMI at PU. Coincidentally, during the first years of my work at FMI, Assoc. Prof. Kiskinov and me were in the same office. The many informal conversations have convinced me that he has a wealth of both mathematical and general knowledge. In my contacts with the candidate over the years, I have become convinced that he has the desire to share his knowledge and skills, both in science and teaching, and in life. I can say that he is correct and honest.

During his teaching work, Assoc. Prof. Kiskinov assigns course and homework to students for individual self work, related to the studied material, which then he reviews and evaluates.

EVALUATION OF SCIENTIFIC AND SCIENTIFIC-APPLIED ACTIVITIES

The candidate has correctly divided his scientific contributions into three directions

1) Functional and real analysis

2) Fractional differential equations and systems with a delayed argument

3) Mathematical modeling and application of mathematics.

1) In the field of functional and real analysis fall the publications [3,4,5,12,18,21,22]. Impulse differential equations in Banach spaces are studied in [4,5]. A new result is obtained in the field of the theory of fixed points in uniform spaces in [3]. On one class of abstract integral equations with two nonlinear operators in metric space is investigated in [12]. Results for the properties of conformable derivatives in Banach spaces are obtained in [22]. The connection between two conformable derivatives of different order is found and as a consequence an important result is obtained, that an abstract function has a conformable derivative at a given point (which does not coincide with the lower terminal of the conformable derivative), if and only if there is a first-order derivative at the same point. The article [18] makes some remarks on the newly introduced conformable derivative as a type of local fractional derivative and presents a surprising result for the relationship between conformable derivatives and ordinary derivatives of integer order. As a consequence an initial problem for nonlinear differential system with conformable derivatives is studied. A schema of how to transform it into an equivalent well-studied initial problem for a system of equations with delays with integer first derivatives and subsequently as standard in a system of Volterra integral equations is shown. Interesting is the article [21] which analyzes the possibility of coincidence of the left and right fractional derivatives of Caputo in a given interval. It is proved that a function whose left and right Caputo fractional derivatives coincide in a given interval can only be a constant. As a result, it is stated why a number of "results" obtained by other authors under this assumption were wrong.

2) In this direction are articles [6,7,8,9,10,11,13,14,16,17,19,20,23,24]. Delayed differential fractional systems [7,8,10,14,16,17,20,23] and neutral differential fractional systems [6,9,11,19,24] are studied. For fractional differential systems and equations, the various papers establish sufficient conditions for the existence and uniqueness of solutions for delayed or neutral, linear or nonlinearly disturbed, autonomous or non-autonomous systems, under different types of initial conditions (including or not Riemann-Liouville derivatives). Different classes of initial functions (continuous, partially continuous, Lebesgue measurable) and systems with different types of fractional derivatives (Riemann-Liouville or Caputo, in both cases of incommensurate fractional order and also Caputo of distributed order) are considered. Conditions for different types of stability (global asymptotic stability, finite time stability) are obtained. The existence of fundamental matrices of the corresponding homogeneous systems has been proved for different fractional differential systems. Their properties have been studied and integrated representations of the solutions have been obtained.

3) In this direction are articles [1,2,15]. A new Monod type reactor model has been introduced [1]. The main advantage of the proposed model is the ability to account for the impact of mortality on the growth of bacterial populations over the entire interval of their average life expectancy through a distributed delay. Under these assumptions, the Cauchy problem is formulated for the considered model and it is proved that it has only one globally absolutely continuous solution under non-negative initial conditions. A possible generalization of the classic Monod model of a bioreactor is proposed [2], taking into account the effects of delayed and instantaneous mortality in bacterial populations. A modified Weibull cumulative distribution function is considered [15]. The important characteristic of "saturation" for this function in the sense of Hausdorff is studied. The results are of independent importance in the study of issues

related to real-time analysis, insurance mathematics, biochemical kinetics, population dynamics and debugging theory.

From the list of observed citations, which are indexed in WoS and / or SCOPUS, 34 of the citations are of scientists outside Bulgaria, which shows that the research topic is relevant and the candidate's results contribute to the enrichment of knowledge in it.

A textbook is presented. The textbook is on Discrete Mathematics. The textbook consists of content, introduction, six chapters and literature from 71 sources, written on 426 pages. The large volume of the textbook is impressive, but unlike other areas of mathematics, in discrete mathematics there are no specific topics to be included in an introductory lecture course and/or textbook. This is because Discrete Mathematics involves many different mathematical theories. The author has adhered to the lecture courses he is teaching at the FMI at PU in various specialties, listed in the introduction throughout the years. This is one of the reasons why the volume of the textbook is large, which is actually positive, because the structuring of the material in the textbook allows skipping individual paragraphs and even entire chapters, which makes it suitable for use in lecture courses for all specialties in 4.5 Mathematics. and 4.6 Informatics and Computer Science, as well as 1.3 Methodology of teaching in…, trained at FMI at PU.

It makes a good impression that the co-authors of Assoc. Prof. Kiskinov are both distinguished scientists in the field of differential equations and mathematical analysis, and young colleagues. The young colleagues who are co-authors of the candidate have obtained their PhD degrees in the field of fixed point theory and their co-authorship with Assoc. Prof. Kiskinov shows that he has introduced them to a new field of research.

I have not found "plagiarism" in the works of the candidate in the sense of the "Law on the Development of the Academic Staff in the Republic of Bulgaria" in the Republic of Bulgaria.

WORK WITH STUDENTS

Assoc. Prof. Kiskinov assigns course and homework to students for individual self work, related to the study material, throughout the lecture course, which he reviews and evaluates.

PARTICIPATION IN SCIENTIFIC FORUMS

The participation of Assoc. Prof. Kiskinov in all scientific forums organized by the FMI at PU makes a good impression. The candidate has also participated in 7 international scientific forums since 2015.

PARTICIPATION IN PROJECTS

Assoc. Prof. Kiskinov has participated in 4 internal for PU projects and two national projects

CRITICAL NOTES

The review of the candidate's participation in scientific forums shows that he participated mainly

in the International Conference "Applications of Methematics in Engineering and Economics"

AMEE, Sozopol, organized by TU - Sofia. I recommend that in the future Assoc. Prof. Kiskinov join other conferences, both in Bulgaria and abroad. The co-authors of Assoc. Prof. Kiskinov are from the FMI at PU. I would recommend to the candidate, if he can to find colleagues from other universities, both in Bulgaria and abroad for joint work. This will enrich the candidate's research.

CONCLUSION

In my opinion the candidate Assoc. Prof. Hristo Stefanov Kiskinov, PhD has obtained enough results both in quality and quantity. The presented documents meet the requirements, conditions and criteria of the Law on the Development of the Academic Staff in the Republic of Bulgaria, Rules for applying of the mentioned above law, Rules for the conditions and order for acquiring academic degrees and academic positions at University of Plovdiv "Paisii Hilendarski" to occupy the academic position "Professor". Therefore I give my **strictly positive assessment and I recommend to the Scientific Jury to prepare a report-proposal to the Scientific Council of the Faculty of Mathematics and Informatics at the University of Plovdiv "Paisii Hilendarski" for the election of Assoc. Prof. Hristo Stefanov Kiskinov, PhD for the academic position "Professor"** in the University of Plovdiv "Paisii Hilendarski" in Research area: 4. Natural sciences, mathematics and informatics, Professional field 4.5. Mathematics (Mathematical analysis)

04.04.2022   Signature: ....
Plovdiv   /Prof. Boyan Zlatanov, PhD/