

# OPINION



Worked out by Assoc. Prof. Velika Nikolaeva Kuneva, PhD  
Faculty of Economics  
Agricultural University Plovdiv (AU Plovdiv)  
assigned a member of the scientific jury according  
Order № РД-16-43/19.01.2024 of the Rector of AU Plovdiv

Regarding the competition for the academic position of  
“Associate Professor” at AU Plovdiv

in the field of higher education **4. Natural Sciences, Mathematics and Informatics**  
professional area **4.5. Mathematics**, scientific specialty **Geometry and Topology**,  
announced in the State Gazette, issue 97 from 21.11.2023

with a candidate chief assistant professor **Dimitar Rumenov Razpopov, PhD**  
Department of Mathematics and Informatics,  
Faculty of Economics, AU Plovdiv

## 1. Brief introduction of the candidate.

Assistant Professor Dr. Dimitar Rumenov Razpopov is the only candidate in the present competition. He completed his higher education in 1999 at the Faculty of Mathematics and Informatics, *Paisii Hilendarski* Plovdiv University specializing in Mathematics and Informatics. In 2019 he successfully defended his dissertation work in the scientific specialty *Geometry and Topology* and obtained a Ph.D. degree. From 2000 to 2004, he worked as a teacher of Informatics and IT in the sector of secondary education. His academic career began in 2000 as a part-time lecturer, later becoming an assistant professor, a senior assistant professor, and since 2008 he has been working as a chief assistant professor at the Department of Mathematics and Informatics, Faculty of Economics at the Agricultural University Plovdiv. Since 2019 to the present he has also been working as a chief assistant professor at the University of Food Technologies in Plovdiv, at the Department of Mathematics, Physics, and IT, the Faculty of Economics.

## 2. General description of the scientific production.

The submitted set of materials and documents related to the present competition are arranged properly in conformity with the Regulations for occupying academic positions of AU Plovdiv.

Chief Asst. Dimitar Razpopov participates with a production of 12 scientific works in total grouped as follows:

- ❖ *Impact factor publications – 5;*
- ❖ *Publications in reviewed and referenced scientific journals – 6;*
- ❖ *Publications in conference collections – 1;*

The attached publications and citations are in Web of Science, SCOPUS, ZbMATH, or journals with SRJ indexing. Chief Asst. Prof. Razpopov's personal contribution to the mentioned 11 works is illustrated by the fact that he is the first author in 4 of them, the second author in 4, and the third or subsequent author in the rest.

With relation to the presented research papers, which are performed in collaboration with other authors, it is evident that he excels in teamwork. All of this speaks to his high level of professionalism.

The presented book entitled "On the Geometry of a Riemannian Manifold with Two Circulant Structures," has been reviewed by two reviewers.

Chief Asst. Prof. Razpopov's research work is complemented by 8 presentations at international and 3 at national scientific forums.

❖ *Training handbooks – 2.*

## **2. Teaching work.**

The candidate's teaching activities cover a wide spectrum. His main role as a chief assistant professor involves conducting practical classes to undergraduate students in full-time and part-time study programs in the following disciplines: Applied Mathematics, Higher Mathematics, Higher Mathematics Parts I and II, Optimization Methods and Business Logistics. In recent years he has delivered lectures to undergraduate students in the following subjects: Applied Mathematics, Linear Algebra and Analytical Geometry, Statistics, Biostatistics, Financial Mathematics, Econometrics, and Game Theory. He has conducted classes of Applied Mathematics, Biostatistics and Economic Statistics for master's degree students, and of Data Processing for doctoral students at the Agricultural University. Since 2019 he has also been teaching mathematics in Bulgarian language to foreign students at the Language Department of AU Plovdiv.

His total classroom and extracurricular workload for the period 2018–2023 is 2801.05 academic hours. The candidate's teaching work is complemented by supervising 4 graduates who has successfully defended their bachelor's degree theses.

As part of his teaching and pedagogical work Chief Asst. Prof. Razpopov has co-authored two textbooks: "Guide to Higher Mathematics" (2010) and "Guide to Statistical Data Processing for Doctoral Students" (2023), which can be used by students and other professionals interested in the application of modern mathematical and statistical methods.

## **3. Scientific work.**

I positively acknowledge and evaluate the contributions outlined in the candidate's authorship report, which are logically derived from the obtained results and have both theoretical and practical significance. Essentially, Chief Asst. Prof. Razpopov's results can be categorized into two main thematic areas:

- ❖ Differential Geometry of Smooth Riemannian Manifolds with Circulant or Skew-Circulant Structure. This category includes 9 publications and 1 book;
- ❖ Application of mathematical-statistical approaches for quantitative and qualitative evaluation of field crop yields – 2 publications.

In his research papers, Dimitar Razpopov explores curvature properties of 3-dimensional and 4-dimensional Riemannian manifolds equipped with an additional tensor structure – circulant or skew-circulant – which is compatible with the Riemannian metric, resulting in isometries being generated in each tangent space layer. Associated with the four-dimensional manifolds are almost Hermitian manifolds with skew-circulant structures. A classification of almost Hermitian manifolds is made according to the classes of A. Gray and L. Hervella. Classes of almost Einstein manifolds and Einstein manifolds are distinguished.

In the presented research works Chief Asst. Prof. D. Razpopov applies mathematical-statistical methods for the quantitative and qualitative assessment of agricultural crop yields.

These thematic areas represent Dr. Razpopov's scientific and practical contributions, showcasing his expertise in both differential geometry and the application of mathematical-statistical methods in agricultural research.

Classes of studied three-dimensional and four-dimensional manifolds have been defined, whose curvature tensors are invariant with respect to the additional structure. Classes of almost Einstein manifolds and Einstein manifolds, as well as their curvature properties have been obtained.

Various examples have been constructed on Lie groups of the considered manifolds and their geometric properties have been found.

Issues related to applications in physics have been investigated, such as computing the work of a vector force field on a curve defined with respect to an indefinite metric on tangent spaces of three-dimensional and four-dimensional Riemannian manifolds with circulant structure.

Equations of hyperspheres, spheres and circles with respect to an indefinite metric in special subspaces of the tangent space of the four-dimensional manifold with skew-circulant additional structure have been derived, which are interpreted in the Euclidean case.

The scientifically justified conclusions drawn in the publications based on various statistical approaches allow for a more objective assessment of the obtained results, which is a significant contribution to practical activity.

#### **Citations of the candidate`s works**

Chief Asst. Prof. Dimitar Razpopov has provided a citation report of 19 citations of his publications, mainly in refereed and indexed mathematical journals with Impact Factor (IF)/SJR. The total number of citations not only meets the requirements for the position of *Associate Professor* at the Agricultural University Plovdiv, but significantly exceeds them.

#### **Participation in research projects**

Chief Asst. Prof. D. Razpopov has submitted a reference proving his participation in 4 research projects. Three of them are under the leadership of the Plovdiv University, and one – in working packages 1.1. and 3.1. of *Intelligent Crop Science* National Research Program developed by AU Plovdiv.

#### **5. Notes and recommendations.**

I have no critical notes and recommendations.

#### **6. Personal expressions for the candidate.**

I am aware of the candidate`s whole career development. I have known him since he was appointed a part-time lecturer at the Department of Mathematics and Informatics, which followed by the successful defense of his dissertation work, as well as his research work up to the present.

I am impressed by his personal and professional skills and qualities. He has gained respect and trust among his colleagues and students. He is reputable lecturer and thorough researcher.

#### **7. Conclusion.**

Taking into account the analysis of the candidate`s teaching, scientific-theoretical and scientific-applied work, I consider that **Chief Asst. Prof. Dimitar Razpopov, PhD**, meets the requirements of ADASRB, the Regulations for application of ADASRB and the AU`s Regulations for its application regarding the academic position of "**Associate Professor**".

Chief. Asst. Dimitar Razpopov has established himself as a competent and motivated scientist and researcher.

All the above mentioned gives me grounds to evaluate **POSITIVELY** the candidate`s whole work.

I allow myself to propose to the honorable scientific jury to vote **positively**, and the faculty council of the Faculty of Economics to elect **Chief. Asst. Dimitar Rumenov Razpopov, PhD**, for the position of "**Associate Professor**" in the scientific specialty **Geometry and Topology**, professional area **4.5. Mathematics**, field of higher education **4. Natural Sciences, Mathematics and Informatics**.

15.02.2024  
Plovdiv

**OPINION**

**WORKED OUT BY:** .....

(Assoc. Prof. Velika Kuneva, PhD)

