

REPORT

to occupy the academic position:

"Professor"	
"Associate Professor"	X
	one of the academic positions indicated shall be marked with the sign "X"

Candidates to occupy the position:

1	Chief assistant professor	Dr.	Dimitar	Borisov	Borisov	University of Chemical Technology and Metallurgy
№	academic position	scientific degree	name	middle name	last name	workplace

Scientific area:

5	Technical sciences
code	name

Professional area:

5.13	General Engineering
code	name

Scientific specialty:

Technologies and Systems for Environmental Protection.
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The competition has been announced:

104	05.12.2025	"Environmental Engineering"	Chemical and systems engineering
in SG issue	date	for the needs of the Department	Faculty

The report was written by:

Associate Professor	Dr.	Dimitar	Tsvetkov	Peshev	University of Chemical Technology and
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					Metallurgy
academic position	scientific degree	name	middle name	last name	workplace

1. Report for the candidate:

Chief assistant professor	Dr.	Dimitar	Borisov	Borisov
academic position	scientific degree	name	middle name	last name

1.1. Meeting the minimum requirements under the Regulations:

A) The candidate meets the minimum requirements	20 points	X
B) The candidate doesn't meet the minimum requirements	0 points	
		one of the answers given is marked with the sign "X"

It must be filled in if answer B is marked. The publication activity of the candidate is analyzed. The response of the results achieved (quoted) is analyzed.

The sole candidate in the competition, Chief Assistant Professor Dimitar Borisov Borisov, has submitted all materials in accordance with the requirements of the Academic Staff Development Act and its implementing regulations. A total of 19 scientific publications, one habilitation work (monograph), and one published university textbook have been submitted for participation in the competition.

The habilitation work (monograph) under Indicator 3 is based on 11 own scientific publications in peer-reviewed journals. The habilitation work represents a comprehensive and thorough study on special methods for optimization with accelerated convergence, strategies for multi-criteria optimization, as well as the application of this theory for optimal decision-making. The work is presented over 225 pages. The bibliography is comprehensive and appropriate. It satisfies the definition of "monograph" according to § 1, item 10 of the Additional Provisions of the Academic Staff Development Act.

From scientific publications published in journals that are referenced and indexed in world-renowned databases with scientific information, the candidate accumulates 120 points. From publications in non-referenced peer-reviewed journals or in edited collective volumes – 233.3 points. Thus, cumulatively for indicators 5-11, the candidate has 353.3 points against a requirement of 200 points. A total of 50 points from citations have been presented, which matches the required minimum of 50. Citations in publications indexed in world-renowned databases with scientific information are only 4, which in professional field 5.13 is an indication of relatively low impact of the published results.

1.2. Relevance of scientific and / or applied research:

A) The research is relevant. Part of the research is pioneering (no results are known on the topic by other authors)	8 points	
B) Research is relevant. Results from other authors are known for each of the topics and / or applications studied.	6 points	X
C) Most of the research is relevant, but also some results are presented that have no scientific and / or applied value	4 points	
D) The smaller part of the research is relevant	2 points	
E) Research is not relevant	0 points	
		one of the answers given is marked with the sign "X"

The evaluation of the relevance of the research must be substantiated.

The scientific interests of Chief Assistant Professor Dimitar Borisov are in the field of optimization with a pronounced interest in applications for minimizing waste in the metallurgical industry and materials science, as well as in the application of neural networks in solving problems in the fields of medicine and fire safety.

These scientific studies and achieved results can easily be linked to the societal challenges of the European Commission, such as "health," "climate, energy and mobility," and "natural resources and environment." The published results are based on known methods and/or theoretical frameworks, resulting in a grade of B for this indicator.

1.3. Objectives of the research:

A) Realistic and of scientific and / or applied interest	8 points	X
B) Realistic, but not of scientific and / or applied interest	4 points	
C) Unattainable (unrealistic)	0 points	
		one of the answers given is marked with the sign "X"

Objectives must be specified. The type of the set objectives must be justified

The objectives that Chief Assistant Professor Borisov has set in his scientific works submitted for this competition are well-justified, realistic, clearly formulated, and correspond to current scientific pursuits in the field of research, and fully align with the achieved results.

1.4. Candidate research contributions:

A) With lasting scientific and / or applied response, they form the basis for new research and applications	20 points	
B) They are of significant scientific and / or applied interest, complete and / or summarize previous research	16 points	X
C) They are of scientific and / or applied interest	12 points	
D) Lack of significant contributions	8 points	
E) Lack of contributions	0 points	
		one of the answers given is marked with the sign "X"

Contributions must be specified. The type of results achieved must be justified.
<p>The main scientific and applied contributions described in the publications for this competition can be grouped into the following areas:</p> <ol style="list-style-type: none"> 1. Novel methods and algorithms for accelerated one-dimensional, multidimensional, and multi-extremal optimization. Combined methods based on dichotomy, golden section, Kiefer-Johnson method, and Fibonacci numbers have been proposed. Six methods for one-dimensional optimization, a stochastic method for multidimensional optimization with three modifications, accelerated algorithms for ravine-type objective functions, and 4 new methods for multi-extremal optimization based on Price's method have been developed. The new methods demonstrate 2 to 4 times faster convergence than baseline methods. 2. Strategies for multi-criteria optimization. Fractional-rational strategies with and without weighting coefficients have been proposed and applied to real technological objects. 3. Deep learning models applicable in safety and autonomous systems. Methods for improving accuracy through image preprocessing have been developed. Accuracy exceeding 92% has been achieved in fire detection. Real-time application in autonomous vehicles using a well-known open-source model for object detection has been demonstrated. 4. Models for medical diagnostics. A method for detecting brain anomalies from computed tomography with high accuracy to support medical diagnostics has been investigated. <p>The contributions in item 1 are of a theoretical nature, while the remaining results have an applied scientific character.</p>

1.5. Participation of the candidate in the achievement of the presented results:

A) The candidate has at least an equal participation in the submitted papers	8 points	X
B) The candidate has at least an equal participation in most of the submitted papers	7 points	
C) The candidate has a secondary participation in most of the submitted papers	4 points	
D) The candidate participation is unnoticeable	0 points	
		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the items C or D is marked.

1.6 Pedagogical activity:

A) The candidate has effective and sufficient pedagogical activity at the university. The textbooks issued are modern and useful (they meet the requirements of the Regulations). The work with undergraduate and doctoral students is at a high professional level.	8 points	X
B) The candidate has sufficient pedagogical activity at the university. The textbooks issued satisfy the requirements of the Regulations.	6 points	
C) The pedagogical activity and / or textbooks issued are insufficient (do not meet the requirements of the Regulations)	0 points	
		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the items B or C is marked.

1.7. Critical notes:

A) Lack of critical notes	8 points	
B) Critical notes of a technical nature	7 points	

C) Critical notes that would partially improve the results achieved in a small part of the research	5 points	X
D) Critical notes that would partially improve the results achieved in most of the research	3 points	
E) Significant critical notes	0 points	
		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the answers C, D or E is marked.

Low impact of the candidate's research activity in the world literature. I recommend that future scientific results prioritize publication in journals indexed in world-renowned databases with scientific information, which will also contribute to increasing the likelihood of a favorable effect on addressing current societal challenges.

In the presented full text of the habilitation work (monograph), there are technical errors and carelessness in formatting. I recommend a higher level of precision in presenting results in future publications.

1.8. Conclusion

A) The evaluation of the candidate's activity is POSITIVE	This evaluation is assigned to a total number of at least 50 points	X
B) The evaluation of the candidate's activity is NEGATIVE	This evaluation is assigned to a total number below 50 points	
		one of the answers given is marked with the sign "X"

To be filled in if requested by the member of the scientific jury

As a result of the review and analysis of the submitted documents for the announced competition, I express my confident positive assessment that the candidacy of Chief Assistant Professor Dr. Dimitar Borisov Borisov meets all qualitative and quantitative requirements, and I recommend to the Faculty Council of the Faculty of Chemical and Systems Engineering at the University of Chemical Technology and Metallurgy Sofia to elect him as "Associate Professor" in the scientific specialty 5.13. General Engineering (Technologies and Systems for Environmental Protection).

16.03.2026	The report was written by:	
date	Assoc. Prof. Dr. Dimitar Tsvetkov Peshev	signature