

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	Assistant professor	PhD	Dimitar	Borisov	Borisov	UCTM
№	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:

Environmental protection technologies and systems

The competition has been announced:

104	5.12.2025 г.	Environmental engineering	Faculty of Chemical and System Engineering
in SG issue	date	for the needs of the Department	Faculty

The report was written by:

Associate professor	PhD	Kremena	Yasenova	Dedelyanova	UCTM
academic position	scientific degree	name	middle name	last name	workplace

1. Report for the candidate:

Assistant professor	PhD	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.

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 research presented by the candidate, Assistant professor Dr. Borisov, is up-to-date. New methods and algorithms are proposed, suitable for estimating parameters in various mathematical models. Optimization algorithms and solutions related to solving problems in ecology and environmental protection are presented.

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 main objectives of the research in the scientific papers presented by the candidate, Assistant professor, PhD Borisov, are realistic and of scientific or applied interest. They are related to the presentation of models and optimization of methods and algorithms and can be used to solve real problems in ecology.

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.

The scientific and applied scientific contributions can be summarized as follows:

1. New combined methods with accelerated convergence for optimization are proposed, based on the dichotomy, the golden section and the Kiefer-Johnson method, and 6 combined new methods are proposed.
2. A new heuristic algorithm with accelerated convergence for one-dimensional optimization in an unbounded space is proposed and studied.
3. A new stochastic random search method and algorithm for multidimensional optimization with accelerated convergence are proposed, and three new modifications of it are proposed.
4. A new accelerated algorithm for multidimensional optimization for complex ravine objective functions is proposed. The main goal is to combine the advantages of the method for random search from multiple random directions with a constant step for searching for

extrema of unimodal functions and the advantages of the method of Gelfand and Zetlin.

5. A new accelerated algorithm for multiextremal optimization based on the Price method is proposed.

6. New fractional-rational generalized strategies for finding an optimal solution with and without the use of weighting coefficients are proposed. The proposed strategies are investigated with real technological examples. Results are presented and leading solutions are recommended.

7. A method is proposed to improve the accuracy of a deep learning model for fire detection by preprocessing images collected by cameras.

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.

In a large part of the presented works, the candidate Assistant professor Dr. Borisov is the sole or first author, which testifies to his contribution to the research conducted and the results obtained.

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	
B) The candidate has sufficient pedagogical activity at the university. The textbooks issued satisfy the requirements of the Regulations.	6 points	X
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"
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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	X
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	
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.

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
According to the submitted materials for the competition, the candidate, Assistant Professor

Dr. Eng. Dimitar Borisov meets the conditions for occupying the academic position "Associate Professor". On this basis, I propose to the Scientific Jury of the competition to recommend to the Faculty Council of the Faculty of Chemical and Systems Engineering at the University of Chemical Technology and Metallurgy in Sofia to elect Assistant Professor Dr. Eng. Dimitar Borisov to occupy academic position "Associate Professor" in the professional area 5.13 General Engineering, Scientific specialty Environmental protection technologies and systems at UCTM.

date	The report was written by:	
12.03.2026	Assoc. Prof. Kremena Yasenova Dedelyanova, PhD	signature