

REVIEW

to occupy the academic position:

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

Candidates to occupy the position:

1	Assoc.Prof.	PhD	Dimitar	Petrov	Donchev	UCTM-Sofia
№	academic position	scientific degree	name	middle name	last name	workplace
2						
№	academic position	scientific degree	name	middle name	last name	workplace

Scientific area:

5	Technical sciences
code	name

Professional area:

5.1	Mechanical Engineering
code	name

Scientific specialty:

Applied mechanics

The competition has been announced:

67	13.08.2021	Applied mechanics	FMMS
in SG issue	date	for the needs of the Department	Faculty

The review was written by:

Professor	Doctor	Emil	Georgiev	Mihailov	UCTM, Sofia
academic position	scientific degree	name	middle name	last name	workplace

1. Review for the candidate:

Assoc. Prof.	PhD	Dimitar	Petrov	Donchev
academic position	scientific degree	name	middle name	last name

1.1. Completion of the provided documents:

A) The competition documents are in full compliance with the Regulations	3 points	X
B) The documents are complete but do not fully comply with the requirements of the Regulations	2 points	
C) The documents are not completed in accordance with the requirements of the Regulations	0 points	
		one of the answers given is marked with the sign "X"

Missing documents and violated requirements must be described if response C is marked.

1.2. 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 candidate, Assoc. Prof. PhD eng. Dimitar Petrov Donchev satisfies the minimum requirements for holding the academic position "Professor" according to the university and national regulations about the scientific field 5. Technical sciences

The indicators of the candidate for the academic position "Professor" at UCTM are as follows:

- A (50 points) - Dissertation.
- B (164 points). 10 publication in journals, referred and indexed in world-famous databases.
- G (389,43 points at a required minimum of 200 points) – 5 scientific publications in publications referred and indexed in world-famous databases of scientific information (49,34 points) and 52 publications in non-refereed journals and collective proceedings with scientific review (330,49 points).
- D (659 at a required minimum of 100 points) - 510 points by citations and reviews in scientific journals, referenced and indexed in world-famous databases with scientific information, 63 by citations in monographs and other editions and 6 point by non-referred journals with scientific peer-review.
- E (500 points at a required minimum of 100 points). Four PhD student was defended at the co-supervising of Assoc. Prof. Donchev (80 points). There are 4 participations in national scientific or educational projects (40 points), 7 participations in international scientific or educational projects (140 points), 4 managements of international scientific or educational project (160 points). 20 points were formed as results of, published university textbook as coauthor and 60 points by attracted funds.

1.3. 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)	7 points	
B) Research is relevant. Results from other authors are known for each of the topics and / or applications studied.	5 points	X
C) Most of the research is relevant, but also some results are presented that have no scientific and / or applied value	3 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 presented scientific work are related to research, experimental and theoretical, in order to understand better the fundamental aspect, assimilation, and application at the global and local level of the behavior of materials, heterogeneous in nature, different in types and rheological behavior. The problems cover a range of behaviors of structural materials and structures: elasticity, viscoelasticity, plasticity, reinforcement, external reinforcement (strengthening), damage, and failure. The aim is to combine physical and mechanical aspects, experimental and theoretical approaches. Activities focus on the analysis of the mechanisms and mechanics of behavior, defects, and destruction of structural materials and structures.

1.4. Knowledge of the problems subject of research:

A) The candidate knows in detail the achievements of other authors on the researched topics and/or applications	6 points	X
B) The candidate is partially familiar with the achieved results on the researched topics and / or applications	4 points	
C) The candidate has no prior knowledge of the status of the researched problems	0 points	
		one of the answers given is marked with the sign "X"

The evaluation must be substantiated if answer C is marked.
The candidate analyzes, interprets, cites and creatively applies the results achieved by other researchers, applied and publishing activity. Additionally he contributes to the enrichment of theoretical knowledge and information in different areas of research.

1.5. Type of research:

A) Theoretical	4 points	
----------------	----------	--

B) Applied	4 points	
C) Theoretical with application elements	4 points	X
D) It does not correspond to the level specified in the Act for the Development of the Academic Staff in the Republic of Bulgaria and the Regulations	0 points	
		one of the answers given is marked with the sign "X"

The level of research must be substantiated if answer D is marked.

1.6. 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 of the research are realistic. They are achieved via complex and adequate modern research methods.

The candidate's researches have a scientific and scientifically-applied character – they are aimed at solving of real problems of the engineering practice.

1.7. Methods of research:

A) Adequate to research and set scientific objectives and /or applications	8 points	X
B) Partially appropriate, enabling part of the scientific objectives and / or applications to be achieved	4 points	
C) Inappropriate methods	0 points	
		one of the answers given is marked with the sign "X"

Methods must be specified. The type of methods used is justified.
<p>A wide range of methods, including mathematical modeling and various approaches for analyze of data.</p> <p>A theoretical, analytical and numerical models, as well as experimental procedures (approaches) to link the microstructural material parameters with the microscopic characteristics of the studied classes of materials subjected to different conditions of impact, mechanical and thermal loading are developed.</p> <p>The goals set in the research are realistic and are achieved by adequate applications of modern research methods. For providing the investigation a different software products for engineering and scientific research has been mastered and actively used.</p>

1.8. 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 research activities of the candidate are developed in the following directions:</p> <ul style="list-style-type: none"> Modeling of behavior of heterogeneous materials, homogenization, behavior of nanomaterials and nanosuspensions. Modeling and simulation of damage and failure of structural materials, hybrid structures, (reinforced concrete reinforced with composite materials). Application of composite materials in civil engineering for reinforcement / rehabilitation of reinforced concrete structures: dimensioning, calculation and simulation of the behavior under different load conditions of hybrid structures made of strengthened concrete reinforced with composite materials. <p>Some of the major contributions in these areas are described below:</p> <ul style="list-style-type: none"> The reason for the violation of durability, related to the presence of initial imperfections, the development of the damage associated with creep (maybe partially reversible), and finally with the emergence and development of a highway crack is substantiated. A method for studying the damage in solids has been developed. A numerical model was built by the finite element method for studying the behavior of concrete in the conditions of restriction, damage, and plasticity. A micromechanical scale model of the individual layer in a multilayer composite structure, capable of describing the origin (initiation) of the damage, on the one hand on the filament/matrix interface and on the other hand on the pore surface (damage in the matrix) is proposed. The knowledge of the factors, the mechanisms limiting the qualities, the reliability and the durability of the studied construction materials and constructions has been improved.

- The various mechanisms related to deformation (elastic, plastic), damage, and fracture observed in experimental and real conditions have been studied and evaluated.
- The behavior of the studied composite, structural materials of natural origin for reinforcement of structures under different loading conditions is characterized and qualified;
- A methodology for application of modeling in reinforcement/repair of structures by gluing composite biomaterials have been developed and validated.
- Methodology containing recommendations for strengthening/repairing structures by gluing composite biomaterials has been developed.

1.9. 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.

It is assumed that the candidate has at least equal participation in the submitted works due to the lack of distribution protocols between the authors.

1.10. 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.

1.11. 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.

1.12. Conclusion

A) The evaluation of the candidate's activity is POSITIVE	This evaluation is assigned to a total number of at least 65 points	X
B) The evaluation of the candidate's activity is NEGATIVE	This evaluation is assigned to a total number below 65 points	
		one of the answers given is marked with the sign "X"

To be filled in if requested by the reviewer

I give a positive assessment and propose to the scientific jury to accept and evaluate positively the candidacy of Assoc. Prof. PhD eng. Dimitar Petrov Donchev for the academic position "Professor" in the scientific specialty "Automation of engineering work and systems for automated design", professional field 5.1. Mechanical Engineering, field of higher education 5. Technical sciences.

Candidate ranking (in case of more than one candidate who has received a positive evaluation to occupy the academic position):

Based on the assigned points, the candidates who have received a **positive** evaluation are ranked as follows:

1	Assoc. Prof.	PhD	Dimitar	Petrov	Donchev	94
place	academic position	scientific degree	name	middle name	last name	points
2						
place	academic position	scientific degree	name	middle name	last name	points
3						
place	academic position	scientific degree	name	middle name	last name	points

	The review was written by:		
17.11.2021	Emil	Georgiev Mihailov	signature