Appendix 12c

REVIEW
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	PhD	Stoyko	Aleksandrov	Petrin	UCTM
№	academic position	scientific degree	name	middle name	last name	workplace

Scientific area:

5	Technical Sciences
code	name

Professional area:

5.11.	Biotechnology
code	name

Scientific specialty:

Technology of Biologically Active Substances

The competition has been announced:

71	07.08.2026	Biotechnology	Faculty of Chemical and System Engineering
in SG issue	date	for the needs of the Department	Faculty

The review was written by:

Assoc. Prof.	PhD	Yana	Yordanova	Evstatieva	Sofia University “St. Kliment Ohridski”
academic position	scientific degree	name	middle name	last name	workplace

1. Review for the candidate:

Chief Assistant Professor	PhD	Stoyko	Aleksandrov	Petrin
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.
According to the report on the fulfilment of the minimum required points for the academic position of Associate Professor in professional field 5.11. Biotechnologies (Technology of Biologically Active Substances), announced by UCTM in State Gazette No. 71 of 07.08.2026, the candidate exceeds the minimum required points in all groups of indicators. Under the indicator of Group A, the candidate holds the educational and scientific degree "Doctor" (PhD) and has submitted the extended abstract of the dissertation for the acquired degree (50 points). In Group C, indicator 4 (Habilitation thesis in the form of scientific publications, no fewer than 10, in journals referenced and indexed in world-renowned scientific databases), the candidate has submitted 10 publications in referenced and indexed journals. Against the required 100 points, Chief Assist. Prof. Petrin has achieved 104.81 points. In Group D, under indicator 7, the candidate has submitted 17 publications in referenced and indexed journals, totalling 165.81 points. Under indicator 8 of the same group, he has submitted 9 publications in non-referenced journals, totalling 50.33 points. The total score for the indicators of Group D is 216.14 points. Under the indicators of Group E, the candidate has presented a total of 57 citations of his scientific publications, amounting to 173 points. The discrepancy observed in the documents submitted by the candidate is due to the summation of the points. The total number of citations of the scientific output submitted for the competition is very high. In accordance with the Regulations, these citations account for 173 points, exceeding the required 50 points several times over. This attests to the topicality of the research conducted by the candidate and to the quality of his scientific publications. In addition, the competition documents include, under Group F, a published university textbook or a textbook used in the school system, which contributes 40 points. This fulfils the requirement of Art. 43, para. 2, item 4 of the Regulations on the Terms and Procedure for Acquiring Scientific Degrees and Holding Academic Positions at UCTM. The candidate, Stoyko Aleksandrov Petrin, has held the academic position of Chief Assistant Professor at UCTM for more than six academic years. He has also submitted a list of four lecture courses. Since 2021, Chief Assistant Prof. Petrin has been assigned lecture hours in the Bachelor's and Master's degree programmes in Biotechnologies. The additional information provided satisfies the requirements of Art. 43, para. 2 of the same UCTM Regulations.

Chief Assist. Prof. Stoyko Petrin has actively participated in 10 research projects, 6 of which were funded by the Bulgarian National Science Fund (BNSF). He has led 4 research contracts with the Research Sector at UCTM. Under his supervision, 17 diploma theses have been developed and successfully defended: 11 for the Bachelor's degree and 6 for the Master's degree. The evaluation of the documents submitted by Chief Assist. Prof. Stoyko Petrin shows that he meets and exceeds the minimum requirements for the academic position of Associate Professor in professional field 5.11. Biotechnologies, with a total score of 543.95 points across all indicators.

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 research of Chief Assist. Prof. Stoyko Petrin, PhD, focuses on the kinetics of enzymatic processes, the pretreatment and bioconversion of various types of lignocellulosic biomass, the production of high value-added cellulose products and fermentable sugars, the development of biocomposites, the valorisation of plant residues and natural bioactive compounds, and the synthesis and characterisation of bioactive peptides. The publications in these fields, indexed in international scientific databases, demonstrate the topicality of this research and point to considerable potential for its further development.

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.
I consider Chief Assist. Prof. Petrin, PhD, to be an expert in the research area of the competition, in which he carries out his scientific work. This is confirmed by the well-structured contributions, organised into six main research directions and based on the publications submitted for the competition, in several of which he is the first author. This gives me grounds to believe that he has a detailed knowledge of the achievements of other authors, carries out a critical analysis of them, and successfully highlights the contributions and novelty of his own results.

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.
The research of Chief Assist. Prof. Stoyko Petrin, PhD, is of a scientific and applied nature. Its fundamental component covers the physicochemical and kinetic regularities of the enzymatic and acid hydrolysis of cellulosic and lignocellulosic materials, including the development and validation of kinetic models. Its applied orientation is evident in work on bioconversion of plant biomass into fermentable sugars and second-generation bioethanol, production of microcrystalline and modified cellulose, fibreboards with reduced synthetic resin content, and biologically active compounds. This defines the research as interdisciplinary, with clear potential for technological implementation.

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 research objectives of Chief Assist. Prof. Stoyko Petrin, PhD, are clearly formulated and realistic, as they are aligned with the available experimental facilities, with the research projects carried out and with current trends in biotechnology. Their scientific interest lies in elucidating the mechanisms and kinetic regularities of the enzymatic and acid hydrolysis of lignocellulosic materials, and in characterising natural and synthetic biologically active compounds. Their applied interest focuses on the efficient valorisation of renewable and waste plant biomass for producing fermentable sugars, bioethanol, high value-added cellulose products, and environmentally friendly fibreboards. These objectives are in line with the priorities of the circular economy and sustainable development.

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.
The methods used are modern and appropriate to the stated objectives, encompassing physicochemical, biotechnological, analytical and technological approaches. They include various methods for the pretreatment and conversion of plant biomass, for the extraction and synthesis of biologically active compounds, and instrumental and biological methods for the characterisation of the products obtained. The application of kinetic and mathematical modelling contributes to the reliability of the results and makes it possible to control the processes studied.

1.8. Candidate research contributions:

A) With lasting scientific and / or applied response, they form the basis for new research and applications	20 points	X
B) They are of significant scientific and / or applied interest, complete and / or summarize previous research	16 points	
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 contributions of Chief Assist. Prof. Stoyko Petrin, PhD, have had a lasting scientific and practical impact and provide a foundation for new directions of research and application. This is confirmed by the publication of 27 of his papers in journals indexed in Web of Science and Scopus, by 57 citations and by his participation in 10 research projects. The candidate's contributions are summarised in the following research directions: **1. Physicochemical and kinetic regularities of the enzymatic hydrolysis of various types of lignocellulosic biomass.** The mechanism of the initial interaction between cellulase enzymes and the cellulose substrate has been elucidated, and the adsorption has been shown to be best described by the Temkin isotherm. Kinetic models accounting for the heterogeneous nature of the process have been developed and applied: an exponential model for reactions on uniformly heterogeneous surfaces and the modified Prout–Tompkins topochemical equation. A compensation effect between the activation energy and the pre-exponential factor has been established for various types of woody and annual plant biomass, which indicates a common kinetic mechanism. The temperature–time relationships obtained are of considerable importance for the prediction, simulation and technological control of the enzymatic hydrolysis process. **2. Pretreatment and bioconversion of lignocellulosic biomass into fermentable sugars.** A systematic comparative evaluation has been carried out of steam explosion, acid, alkaline and high-temperature pretreatment of fast-growing tree species, annual plants and waste biomass from industrial hemp. It has been demonstrated that, in addition to the chemical composition, the morphological and anatomical features of the feedstock, including its density, are decisive for the efficiency of bioconversion. A specific contribution is the establishment of the positive effect of adding CO_2 during steam explosion pretreatment and of using peracetic acid as an intermediate step to increase cellulose accessibility. The results justify the use of paulownia, poplar and clones of Robinia pseudoacacia L. as promising feedstocks for the production of second-generation bioethanol.

3. Acid hydrolysis and modification of cellulose for the production of value-added products. The technological conditions of dilute sulphuric acid hydrolysis have been determined for the production of microcrystalline cellulose meeting the requirements of the European Pharmacopoeia, and of modified cellulose suitable for the production of microfibrillated cellulose. The depolymerisation of bleached hardwood cellulose is most accurately described by the modified Prout–Tompkins equation, which allows the process to be controlled and simulated. The possibility of using the waste acid hydrolysate for biogas production has also been demonstrated on the basis of the determined biochemical methane potential. These results have a clear practical orientation, as they concern products in high demand on the global market.

4. Production of medium- and high-density fibreboards (MDF and HDF) by the dry process, recycling and valorisation of secondary fibrous raw materials, and use of additives to improve board properties. A research direction has been developed for the partial or complete replacement of synthetic binders in MDF with technical hydrolysis lignin, lignosulphonates and spent coffee grounds. The decisive role of the hot-pressing temperature and of board density in activating the adhesive potential of lignin and in meeting the requirements of European standards has been established. A significant applied contribution is the production of boards with a very low free formaldehyde content by means of formaldehyde-scavenging additives, as well as a substantial improvement in water resistance through the use of alkenyl succinic anhydride, without significant deterioration of the physical and mechanical properties. An optimal high-temperature treatment regime for recycling waste MDF has also been determined, which preserves the wood fibres and limits the pollution of wastewater.

5. Production, modification and characterisation of natural and synthetic biologically active compounds. Technological solutions have been developed for the valorisation of spent lavender biomass through extraction, membrane concentration and spray drying with minimal loss of antioxidant activity, together with an optimised process for the hydrodistillation of clove essential oil. New analogues of biologically active peptides (BIM-23052, FELL and Temporin A) have been synthesised and characterised, and the relationship between structural modifications and biological activity has been traced. It has been shown that targeted changes in the amino acid sequence, stereochemical modification, and bioconjugation can balance the activity, stability, and cytotoxicity of the compounds. These results are of scientific value for the development of new potential drug structures.

6. Spectroscopic approaches for monitoring and characterising chemical transformations, and technological studies on the production of chemical pulp. The applicability of infrared spectroscopy as an analytical tool for real-time monitoring of chemical reactions in solution, without the need to isolate intermediates, has been demonstrated. A kinetic study of the kraft cooking of softwood has been carried out under the conditions of an industrial plant. The optimal active alkali charge for producing bleachable pulp has been determined, as well as the conditions for producing unbleached pulp for the manufacture of kraft papers. The results have direct application in industrial practice and demonstrate the candidate’s successful collaboration with industry.

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.

The fact that Chief Assist. Prof. Stoyko Petrin, PhD, is the first author of most of the submitted scientific papers gives me grounds to consider that his contribution to the results obtained is equal and, in a number of cases, leading.

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.
The candidate, Chief Assist. Prof. Stoyko Petrin, PhD, has published the teaching aid Instrumental Analysis in Biotechnology – Worksheets (UCTM Publishing, Sofia, 2026, 106 pp., ISBN 978-954-465-190-9). Under his supervision, 17 diploma theses have been developed and successfully defended: 11 for the Bachelor's degree and 6 for the Master's degree. The candidate delivers lectures and practical classes at the Department of Biotechnology, and his average annual teaching load over the last five academic years exceeds 360 hours

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.
I have no critical remarks regarding the candidate, Chief Assist. Prof. Stoyko Petrin, PhD, for the academic position of Associate Professor.

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
The review of the candidate's research activity clearly shows that Chief Assist. Prof. Stoyko Petrin, PhD, is an established scientist in the field of biotechnology. His work covers the kinetics of enzymatic processes, the pretreatment and bioconversion of lignocellulosic biomass, the production of high value-added products, and the synthesis and characterisation of biologically active compounds. The submitted publications are relevant to the subject of the competition and contain original scientific and applied contributions. The candidate demonstrates scientific maturity, creative thinking and the ability to select and successfully solve topical problems with a lasting impact on science and practice. The documents and materials submitted by Chief Assist. Prof. Stoyko Petrin, PhD, meet all the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria (ADASRB), the Regulations for its Implementation, and the UCTM Regulations for holding the academic position of Associate Professor. The subject matter and level of the research, together with the originality of the results, satisfy all the criteria for the academic position sought. On this basis, I give a positive assessment of the candidate's overall research and teaching activity. I firmly recommend that the Scientific Jury award the academic position of Associate Professor to the sole candidate in the competition, Chief Assist. Prof. Stoyko Petrin, PhD, in higher education area 5. Technical Sciences, professional field 5.11. Biotechnologies, scientific specialty "Technology of Biologically Active Substances".

06.11.2026	The review was written by: Assoc. Prof. Yana Evstatieva, PhD	
date		signature