

REVIEW

Of the competition for the occupation of the academic position of "associate professor in professional field 5.1 „Machine engineering”, scientific specialty „Applied mechanics (Mechanics of coatings)“, announced in State gazette issue 5/17.01.2020 by University "Prof. Dr. Asen Zlatarov" – Bourgas with the candidate Senior assistant Eng. Polina Ilieva Milusheva-Mandadzhieva, PhD.

Member of the scientific jury:

Prof. DSc. Eng. Stanimir Mihaylov Karapetkov

1. General characteristic of the scientific research and applied research activity of the candidate

Senior Assistant Eng. Polina Ilieva Milusheva-Mandadzhieva, PhD graduated the Engineering and Pedagogical Faculty – Sliven (EPF-Sliven) of the Technical University – Sofia and was awarded the educational and qualification degree "Master" – machine engineer with pedagogical qualification. In 2016 she acquired the educational and scientific degree of PhD in EPF-Sliven in professional field 5.1 „Machine engineering“, scientific specialty „Materials science and technology of machine building materials“. In 2018 Senior assistant Eng. Polina Ilieva Milusheva-Mandadzhieva, PhD, acquired the educational and qualification degree "Master" in the specialty "Engineering design" at the University "Prof. Dr. Asen Zlatarov" - Bourgas.

Senior assistant Eng. Polina Ilieva Milusheva-Mandadzhieva, PhD, has been assistant professor from 2011 to 2015 and senior assistant professor since 2016 in the Department of "Electronics, electric engineering and machine engineering" at the University "Prof. Dr. Asen Zlatarov". She is member of the Union of scientists in Bulgaria and member of the editorial board of the journal "Science. Education. Culture", ISSN 1314-717X.

For participation in the competition, the candidate submitted the following works:

- 1 Author's summary of the PhD thesis for the acquiring of the educational and scientific degree of PhD and 4 publications connected with it;
- 10 scientific publications which are equal to a monography, published in journals referenced and indexed in world-known databases with scientific information (Scopus, indicator V4).
- 1 publication in journal referenced and indexed in world-known databases with scientific information (Scopus, indicator G7);
- 31 publications in non-referenced journals with scientific reviewing

(indicator G8).

Of all 42 publications, 15 are published in English language, the candidate is the only author of 19 papers and is co-author of 23 papers. Of all the publications presented, 29 have been reported at conferences – 1 abroad and 28 at international and national conferences in Bulgaria.

A total of 32 citations were presented, classified in indicator D12 – 5 pieces and in indicator D14 – 27 pieces.

The candidate has taken part in one international scientific and educational project in Germany – indicator E19 and in 5 scientific research projects financed by the Scientific research sector of the University “Prof. Dr. Asen Zlatarov” – Bourgas.

The candidate presented also 1 textbook “Technical mechanics” 2020, Electronic edition: CD, ISBN 978-619-91493-0-0 (indicator E23) and one Collection of problems in technical mechanics, electronic edition: CD, ISBN 978-619-91493-1-7 (indicator E24).

Two patent applications have been submitted, namely № 112894/18.03.2019 and № 112901/04.04.2019 which are published in the official Bulletin of the Patent Authority (indicator E25).

The total number of points by groups of indicators which correspond to the documents presented is 1190. The results are significantly higher than the minimum national requirements and the requirements of the Regulations of the conditions for acquiring of scientific degrees and occupation of academic positions in the University “Prof. Dr. Asen Zlatarov” – Bourgas. The number of points arranged by groups of indicators are presented in the following table.

| Group of indicators content | National requirements | Requirements of the University | Indicator |
|--|------------------------------|---------------------------------------|------------------|
| A Indicator 1 | 50 | 50 | 50 |
| B Indicator 2 | - | - | - |
| V Indicator 3 | - | - | - |
| V Indicator 4 | 100 | 100 | 480 |
| G Total of the indicators from 5 to 11 | 200 | 300 | 332 |
| D Total of the indicators from 12 to 15 | 50 | 100 | 208 |
| E Total of the indicators from 16 to 28 | - | 100 | 120 |
| Total number of points | 400 | 650 | 1190 |

The materials presented for participation in the competition are properly prepared, well arranged and fully comply with the requirements of all regulations.

The topical directions of the works are in the field of mechanics and materials science and can be summarized as follows:

1. Deposition of metal, graphene and wear-resistant coatings onto polymeric materials (5 pcs in journals referenced and indexed in world-known databases with scientific information (SCOPUS) [V4, (3, 4, 6, 8, 10)] and 7 pcs in journals referenced in Bulgaria [G8, (2, 4, 13-15, 18, 28)]).
2. Studies of the mechanical characteristics of the deposited coatings and the surface properties of thin layers (6 pcs in journals referenced and indexed in world-known databases with scientific information (SCOPUS) [V4, (1, 3-5, 7, 9)] and 13 pcs in journals referenced in Bulgaria [G8, (1, 3-10, 13, 21, 25, 29)]).
3. Simulation studies and optimization of mechanical structures with deposited coatings (1 pcs in journals referenced and indexed in world-known databases with scientific information (SCOPUS) [V4, (2)] and 3 pcs in journals referenced in Bulgaria [G8, (26, 27, 30)]).
4. Other directions (9 pcs in referenced and reviewed journals in the country [G8, (11, 12, 16, 17, 19, 20, 22-24)]).

For the present review, I accept all the presented works except for these connected with the PhD thesis. All the publications are in the field of the competition and the scientific research and applied research work of the candidate can be given very high estimation.

Senior assistant Eng. Polina Milusheva-Mandadzchieva has participated in one international educational project in Germany in 2018 and in the working teams of five scientific research projects financed by the Scientific research center of the University "Prof. Dr. Asen Zlatarov" – Bourgas for the period from 2010 to 2019.

2. Estimation of the pedagogical capabilities and activities of the candidate

During the last three academic years, Senior assistant Eng. Polina Milusheva-Mandadzchieva, PhD, has given lectures and exercises with the students from the educational and qualification degrees of "Bachelor" and "Master" studying in the Technical college, Faculty of technical sciences and Faculty of social sciences at the University "Prof. Dr. Asen Zlatarov" – Bourgas. The overall engagement during the last three academic years was as follows: 2019/2020 – 585 hours; 2018/2019 – 595 hours; 2017/2018 – 512,8 hours. She has developed lecture courses on the disciplines "Technical mechanics" for the students of specialty "Software engineering" and "Computer systems and technologies", as well as "Resistance of materials – I" for the students of specialty "Technics and technologies in transportation", EQD "Bachelor", Faculty of technical sciences

regular and part-time forms of education. She has given lecture course on "Computer modelling" for the students from the specialty "Engineering design", course of lectures in the discipline "Preprint preparation and printing" EQD "Master", regular form of education.

Senior assistant Eng. Polina Milusheva-Mandadzheva, PhD, has published one textbook and one handbook as single author. She has been tutor of three graduate students.

Taking into account long term lecturing experience of Senior assistant Eng. Polina Milusheva-Mandadzheva and my personal impressions, I believe that she is well established and respected high school pedagogue.

3. Main scientific research, applied research and practical contributions

Considering the works presented by the candidate, I accept the following contribution as scientific one: „A new approach was suggested and new method for deposition of wear-resistant coating onto polymeric surface was developed. The essence of the method is that the coating is deposited in fluidized bed of Aluminium oxide Al_2O_3 “.

I accept all the other contributions specified in the authors reference of the candidate as applied scientific and practical ones.

4. Significance of the contributions for the science and practice

The scientific, applied scientific and practical contributions of the works off Senior assistant Eng. Polina Milusheva-Mandadzheva, PhD, are of substantial theoretical and practical significance. These I classify into the group of "Proving by new means of essential new features in existing scientific fields, problems, theories and hypotheses". The conclusions are exceptionally important for the engineering practice in the field of studies.

5. Critical remarks and recommendations

- Considering the publications equivalent to monographic work, there is no generalizing topic which could precisely specify the unifying feature for equivalency to monographic work. Such topic could be, for instance, "Deposition of metal, graphene and wear-resistant coatings onto polymeric materials and studies of their mechanical characteristics".

- The distribution of the number of citations in groups D12 and D14 presented by the candidate could be more precise.

CONCLUSION

Regardless of the recommendations made, on the basis of the significant scientific, applied scientific and practical contributions, as well as by my personal impressions, I am fully convinced to propose to the members of the scientific jury

and the respectable Faculty council of the Faculty of technical sciences at the University "Prof. Dr. Asen Zlatarov" to award the candidate Senior assistant Eng. Polina Ilieva Milusheva-Mandadzhieva the academic position of "Associate professor" in professional field 5.1. "Machine engineering", scientific specialty "Applied mechanics (Mechanics of coatings)".

Member of the scientific jury:

26.08.2020 г.

/Prof. DSc. Eng. St. Karapetkov /