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**Subject: Postponement of decision for the programme of study
'Mathematics and Statistics' [4 Years, 240 ECTS, Bachelor, BSc (Hons)],
UCLan Cyprus**

The UCLan Cyprus team would like to thank the evaluation committee members for their constructive feedback towards enhancing the BSc (Hons) Mathematics and Statistics program at UCLan Cyprus. In addition to our response to EEC's comments dated 10th of February 2020, please find below the response to the letter addressed by DIPAE on 24th of February 2020, in which it is recommended the employment of an additional Full-time Academic with expertise in Pure and Applied Mathematics:

“Να προσληφθεί τουλάχιστον ένα ακόμα μέλος μόνιμου ακαδημαϊκού προσωπικού. Στην έκθεση της ΕΕΑ αναφέρεται ότι οι ερευνητικές δραστηριότητες στους τομείς των Καθαρών και Εφαρμοσμένων Μαθηματικών είναι περιορισμένες λόγω του μικρού αριθμού ακαδημαϊκών στους συγκεκριμένους τομείς. Αυτό έχει ως συνέπεια οι φοιτητές να στερούνται της ευκαιρίας συμμετοχής σε ερευνητικές διαδικασίες, με στόχο την καλλιέργεια κουλτούρας σε θέματα έρευνας.

Το νέο πρόσωπο το οποίο προσλάβατε έχει ληφθεί ήδη υπόψη της ΕΕΑ και η προσθήκη ενός μόνο μέλους δεν ικανοποιεί τον ελάχιστο απαιτούμενο αριθμό προσωπικού που απαιτείται για την προσφορά του προγράμματος.”

BSc (Hons) Mathematics and Statistics is a new program in the portfolio of the School of Sciences at UCLan Cyprus, which will start operations after its approval by CYQAA. We strongly believe that for a newly introduced program, the existing members of the program's academic team have sufficient expertise in Pure and Applied Mathematics, so that they can support undergraduate student research in this area, for at least the first two years of their studies. Therefore, we agree with the committee and we recognise the need to further enhance the academic team's expertise in Pure and Applied Mathematics, but this can take place before the commencement of the third year of the program. This ensures that the BSc (Hons) Mathematics and Statistics students will not be disadvantaged of the opportunity to participate in research activities and thus, developing a research culture. In what follows we provide the justification for our position.

UCLan Cyprus is committed to research excellence, evident by its dedication to ethical, responsible, professional and excellent research, since its establishment in 2012. A critical element within the University's commitment is research informed teaching, throughout the curriculum delivery in and out of the classroom and through the co- and extra-curricular activities taking place in the School, its programs and/or at the University level, as well as students' engagement with research activities, which may or may not be embedded in the learning process. Such activities allow students to take an active part in the research process. Following the University's research commitment, throughout all of its programs, the School of Sciences ensures that curriculum delivery combines research informed teaching and it is enhanced with student research activities, which prepare graduates for diverse careers in the international market and develops them to become competent and ethical professionals. To accommodate for this, the School of Sciences aims to recruit outstanding scholars who are highly research active and who continuously pursue new knowledge and innovative ways to apply it through research as well as who are committed to providing an outstanding learning experience. Thus, the BSc (Hons) Mathematics and Statistics program was designed and it will operate within the same aims of the School of Sciences and the University. The academics already employed for the program are all PhD holders and are highly research active in the areas of probability and statistics, pure mathematics and applied mathematics.

Current Academic Research Expertise in Pure and Applied Mathematics

With regards to the specific area of expertise noted by the committee (i.e. Pure and Applied Mathematics):

1. The existing program team includes a senior experienced researcher (Dr. Demetris Christofides), with more than 12 years of research experience and who is internationally recognized for his research in Pure Mathematics, evident by his high impact publications in journals of international repute and his active engagement with peer esteem activities.

Dr Christofides graduated from the University of Cambridge in 2008 receiving from it the Smith-Knight prize for his research. His research is in combinatorics, and in particular, in random graphs and extremal graph theory. He has rather broad research interests within the area of combinatorics and has published papers in positional games, information theory, structural graph theory, algorithms and randomised algorithms, correlation inequalities, computational complexity and isoperimetric problems. He even has interests outside of combinatorics making use of algebraic methods from representation theory in his research and publishing a paper in model theory. As a postdoctoral researcher he was entrusted to work with three different groups whose lead researchers were recipients of the European Prize in Combinatorics.

Dr. Christofides regularly publishes in the best journals in his field. His full publication list can be found in Appendix A, but as an example we provide the below five papers.

- R. Baber, D. Christofides, A. N. Dang, Graph Guessing Games and non-Shannon Information Inequalities, IEEE Transactions on Information Theory, 63 (2017), 4257-4267.
- D. Christofides, and D. Král', First order convergence and roots, Combin. Probab. Comput., 25 (2016), 213--221.
- D. Christofides, J. Hladky and A. Máthé, Hamilton cycles in dense vertex-transitive graphs, J. Combin. Theory Ser. B., 109 (2014), 34--72.
- D. Christofides and K. Markström, The range of thresholds for diameter 2 in random Cayley graphs, European Journal Combinatorics, 35 (2014) 141--154.
- D. Christofides and K. Markström, The thresholds for diameter 2 in random Cayley graphs, Random Structures Algorithms, 45 (2014), 218--235.

As it can be seen, two of these papers were published in journals ranked A* (top 5% of papers: "Virtually all papers they publish will be of a very high quality") by the Australian

Research Council and the other three were published in journals ranked A (next 15% of papers: "The majority of papers in a Tier A journal will be of very high quality").

Further evidence to the quality of Dr. Christofides' research work is the evaluation of his research papers during the latest UK's 2021 Research Excellence Framework exercise in which the above papers were externally evaluated by research experts in the field for their quality and impact. His papers were rated as of 3* - 4* quality (4*: quality that is world-leading in terms of originality, significance and rigor; 3*: quality that is internationally excellent in terms of originality, significance and rigor).

Additionally, through applications for external project funding submitted by Dr. Christofides, the University received referee comments which were praising Dr. Christofides research, demonstrating his international excellence and recognition in his field. We mention some of them with the full reports being available on request:

- "The PI is an influential researcher in the field."
- "The PI with different co-authors recently achieved a remarkable breakthrough in this frontier, improving results of leading experts."
- "The PI is internationally well known."
- "Advancing on this conjecture ... would be significant progress and highly appreciated in the community ... given the expertise of the PI, it is very plausible that progress can be achieved."
- "The new techniques the PI is required to develop will ... lead to ... which was recently proposed by Noga Alon, who is without a doubt one of the current top researchers in combinatorics."

Further to his research, Dr. Christofides is heavily involved in outreach activities. He is a Managing Member of mathematica.gr, a Greek forum for the discussion of mathematical issues and exercises at all levels of Mathematics Education. The forum currently has more than 14,000 members. He is also a Board Member of the Cyprus Mathematical Society. As part of his outreach activities, Dr. Christofides is a trainer for the Mathematical Olympiad team of Cyprus, maintains a problem of the week column in Cyprus Mathematical Society's webpage, he is an excellent problem creator with his problems featuring often in Balkan Mathematical Olympiads and other mathematical competitions. He was also the Chairman of the Problem-Solving Committee and the Chief Coordinator for the Junior Balkan Mathematical Olympiad organized in Cyprus in 2019. Recently, he has published with other co-authors two books on Mathematical Competitions.

The aforementioned activities are very important for building a research culture amongst high school and/or undergraduate students. Such competitions build up the students' problem-solving skills, which are of utmost importance when they become researchers later in their careers. In fact, many famous researchers in mathematics had their first exposure in problem solving through such competitions. In the early stage of the students' undergraduate career, the students often do not have the exposure to the relevant theoretical tools, in order to be really involved in research projects. However, they can still harness their skills by attending problem solving seminars and trying out problems that involve minimal knowledge by higher ingenuity. In fact, Dr. Christofides has very recently initiated the 'UCLan Cyprus Problem Solving Group' with the initial aim of submitting solutions, as a whole group, to problems published by "Crux Mathematicorum", one of the best problem-solving journals in the world. Through this group, interested students can get their first exposure to solving problems not directly related to the methods they already learned, rather than just solving exercises for which they have learned most of the relevant steps that they need to take. For young students, these can be considered as mini research projects where the answer is already known to exist and be within their reach, rather than real research projects with an unknown answer and possibly out of their reach.

2. The team includes an early career and very promising researcher (Dr. Christina Savvidou), who has already demonstrated a great potential for producing high level quality research. Dr. Savvidou will work under the mentorship of Dr. Christofides.
Dr. Savvidou's research interests lie in the areas of Enumerative and Geometric Combinatorics, Positional Games, Patterns in Permutations and Words, Wilf equivalence in Words. During the last two years, Dr. Savvidou's research work on Wilf equivalence was published in peer-reviewed journals and a number of publications are expected to follow as this is currently an ongoing project. In the last few years, Dr. Savvidou has established a good research network of potential collaborators, including well established academics in her field.
3. UCLan Cyprus is working very closely with UCLan Preston for all the operations of the University and more importantly, for the delivery and research engagements within each program. Particularly, the UCLan Cyprus and the UCLan Preston Mathematics teams are cooperating in many different ways (e.g. sharing teaching material, compiling exams and assignments, research projects, thesis supervisions, etc.) and in general, UCLan Preston mathematics academics provide their support to the UCLan Cyprus academic team and students, whenever necessary. As part of this collaboration, UCLan Cyprus students interested to work on a research field which is not related to the specific research expertise of UCLan Cyprus academics, have the opportunity to work with UCLan Preston academics. The UCLan Preston mathematics team includes highly respected researchers of international reputation and with a strong research portfolio. Related to Pure and Applied Mathematics, the UCLan Preston team has three academics, Dr Sylvy Anscombe, Dr Matthew Daws and Dr Timo Laitinen, whose research interests are related to Model Theory, Functional Analysis and Solar Energetic Particles, respectively. Details about the research activities of these academics can be found here: <http://anscombe.sdf.org/research.html>, <https://matthewdaws.github.io/research.html> <http://www.star.uclan.ac.uk/~tl/publications.php>

Student Research Activities

With regards to students' research activities, it is important to highlight that in the area of Mathematics and Statistics it is extremely difficult for undergraduate students to get involved into any significant research activities due to the high level of mathematics knowledge needed, in order to conduct quality research. As it can be clearly seen from the BSc Mathematics and Statistics curriculum content submitted to the committee, during the first two years of their studies, students are studying core modules that are essential and in several cases prerequisites for the advanced and specialized modules that are covered in the later two years of the program. Such modules include Discrete Mathematics, From Geometry into Algebra, Functions, Vectors and Calculus, Algebra and Linear Algebra, Real Analysis, Computational Mathematics, and Mechanics. Therefore, it is extremely unlikely for students to be able to participate in research activities during the first two years of their studies. However, in the case of a gifted student, i.e. a student with the knowledge and skills to conduct research of the desired level and quality, the existing UCLan Cyprus and UCLan Preston academic staff related to the area of Pure and Applied Mathematics have the expertise to support the student throughout the process.

We strongly believe that the existing team's (UCLan Cyprus and UCLan Preston) research and problem-solving expertise, is adequate to build up our undergraduate students' research skills during their first two years of studies, and that opportunities for students to engage in research within the area of Pure and Applied Mathematics will not be hindered and students will have the opportunity to become ready to be involved in research projects in other areas of mathematics in their later years of study.

At the same time, the University understands that the research portfolio of the academic team must be enhanced and expanded to be able to support students' research interests during their final two

years, at the time which the students will be in a better position (in terms of knowledge and skills) to engage with more advanced research activities. The University is committed to expand its team by hiring an additional member of academic staff with expertise in Pure and Applied Mathematics, before the beginning of the third year of the program.

To further justify the position of the University, it should be noted that according to the submitted program's structure, the below teaching needs related to Pure and Applied Mathematics exist during the first two years of the operation of the program:

Year 1 of operation, 3 modules on Pure and Applied Mathematics.

Year 2 of operation, 7 modules on Pure and Applied Mathematics.

The following table presents the teaching needs allocation based on the existing academic team.

	Module	Academic
Year 1 teaching needs	Discrete Mathematics	Prof. Irene Polycarpou
	From Geometry into Algebra	Dr. Demetris Christofides
	Functions, Vectors and Calculus	Dr. Christina Savvidou
Year 2 teaching needs	Discrete Mathematics	Prof. Irene Polycarpou
	From Geometry into Algebra	Dr. Demetris Christofides
	Functions, Vectors and Calculus	Dr. Christina Savvidou
	Algebra and Linear Algebra	Dr. Demetris Christofides
	Real Analysis	Dr. Demetris Christofides
	Computational Mathematics	Dr. Christina Savvidou
	Mechanics	Dr. Christina Savvidou

As indicated on the above table, the existing number of academics with expertise in Pure and Applied Mathematics is sufficient to cover the teaching needs of the course for its first two years of operation. Especially for the first year of operation of the program, there is no evidence to justify the hiring of an additional academic with expertise in Pure and Applied Mathematics, as there will be no available teaching needs to be covered. In contrast, especially during the first year, the existing academics will be below their University standard teaching allocation for the program. During the third year of operation, the teaching delivery needs of the program related to Pure and Applied Mathematics will be increased and under these circumstances, the University recognizes the necessity to employ an additional academic member with expertise in this area. To this end, the University's budget planning for the next 5 years has been amended to include the employment of an additional full-time academic member of staff for the needs of BSc (Hons) Mathematics and Statistics.

We remain at your disposal for any additional clarification necessary.

Yours sincerely,

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Chair of School of Sciences ASQC

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BSc (Hons) Mathematics and Statistics