PBHE "Universum College"
Programme Evaluation
MSc. in Data Science and Analytics

ACCREDITATION

REPORT OF THE EXPERT TEAM

Zagreb & Riga, May 2021

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1. INTRODUCTION

1.1. Context

Date of site visit: February 11th 2021

Expert Team (ET) members:

- Prof. Dr. Damir Kalpić
- Mikus Dubickis, Student expert

Coordinators from Kosovo Accreditation Agency (KAA):

- Naim Gashi, Executive Director of KAA
- Shkelzen Gerxhaliu, Senior Officer for Evaluation and Monitoring
- Arianit Krasniqi, Senior Officer for Evaluation and Accreditation
- Leona Kovaci, Senior Officer for Evaluation and Monitoring
- Ilirjane Ademaj, Senior Officer for Evaluation and Monitoring

Sources of information for the Report:

- *Accreditation manual*
- *KAA Manual Annex 4.4. Template of the External Review Report for programs_09.07.2018*
- *Sample of a Final evaluation report*
- *CVs*
- *Publications*
- *Syllabuses*
- *Scholarships*
- *Annexes*
- *KAA Manual Annex 4.4. Template of the External Review Report for programs_09.07.2018*
- *PBHE "Universum College", Self-Evaluation report, Programme Evaluation MSc. in Data Science and Analytics, January 2021*
- *Sample Compliance calculation - Banking and Finance BSc.Prishtina Univer...*

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- *SVP UMIB Computer Science*
- *Links to Universum documents of web*
- *Virtual visit and meeting according to 1.2. Site visit schedule*
- *Additional documents and information provided after the visit*
- *Web sites of Institute for Advanced Analytics, Alliance Building, North Carolina State University, 901 Main Campus Drive, Suite 230,Raleigh, NC 27606 USA (accessed on 14 APRIL 20121)*:
  https://analytics.ncsu.edu/?page_id=123
  https://analytics.ncsu.edu/?page_id=906

Criteria used for program evaluation:

- *Accreditation manual*
- *Personal experience in evaluations*
- *Personal experiences as university professor / PhD student*

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1.2. Site visit schedule

Kosovo Accreditation Agency (KAA)
Site Visit Program

Programme Accreditation Procedure at Universum College
Date: 30th of March 2021

Expert Team

- Prof. Emeritus, Dr. Damir Kalpić – University of Zagreb
- Mikus Dubickis, PhD student, Riga Technical University

Coordinators of KAA

- Naim Gashi, Executive Director of KAA
- Shkelzen Gerxhaliu, Senior Officer for Evaluation and Monitoring
- Arianit Krasniqi, Senior Officer for Evaluation and Accreditation
- Leona Kovaci, Senior Officer for Evaluation and Monitoring
- Ilirjane Ademaj, Senior Officer for Evaluation and Monitoring

Site Visit Program

30th March

09.00 – 09.40	Meeting with the management of the faculty where the programme is integrated *(no slide presentation is allowed, the meeting is intended as a free discussion)* – Joint session
09.45 – 10:30	Meeting with quality assurance representatives and administrative staff - Joint session
10:30 – 11:15	Lunch break

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11:15 – 12:15	Meeting with the heads of the study programme (Cyber Security, BA Professional, branch in Gjakova) - Separate session
12:20 – 13:20	Meeting with the heads of the study programme (Data Science. MSc) - Separate session
13:25 – 14:05	Meeting with teaching staff – Separate session
14.10 – 14:50	Meeting with employers of graduates and external stakeholders – Separate session
14.55 – 15:05	Internal meeting of KAA staff and experts – Joint session
15:05 – 15:15	Closing meeting with the management of the faculty and program – Joint session

No	Study programs	Experts	Responsible persons of the program
1	Cyber Security, BA Professional, branch in Gjakova (Accreditation)	Damir Kalpić Mikus Dubickis	Xhemile Morina Rrezart Prebreza Durim Gjoshi Besiana Zeka Valerina Smakaj
2	Data Science. MSc (Accreditation)	Damir Kalpić Mikus Dubickis	Lavdim Halilaj Shqipe Buzuku

Other information

Overall instructions for HEIs

1. The students selected for the meeting should reflect a diversity in terms of fields of study, programme, study cycle, year of study, students with special needs if any, etc;
2. The teaching staff selected for the meeting should reflect a diversity in terms of faculties and programmes, full-time and part time, local and international, etc;
3. The students, graduates and employers of graduates should not be employed at the institution;

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4. Anyone whose attendance won't be agreed in advance with KAA and the Expert Team will be asked to leave the interview session;
5. Nametags are to be provided for all people attending the meetings.

Contacts of the participants from KAA:
Shkelzen Gerxhaliu – 044 836 831
Arianit Krasniqi – 045 499 951

1.3. A brief overview of the institution and program under evaluation

A detailed insight in the institution and programme under evaluation can be found in the Self-evaluation report - Program Evaluation, MSc. in Data Science and Analytics, PBHE "Universum College", January 2021. Here will be presented a brief overview. Universum College was established in March 2004, in Prishtina and Ferizaj in order to provide high quality, accessible and affordable educational opportunities to Kosovar and international students through teaching excellence, lifelong learning, applied research and partnership building, attempting to form the students to be thoughtful, responsible and successful.
Among the offered studies, here is of primary interest BSc. in Computer Science, which could be followed by the proposed MSc. in Data Science and Analytics.
Universum College is the most internationalized higher education institution in Kosovo, co-operating with respected educational institutions in the world. The education uses digital technology and Universum College is ranked in Top 1000 of the best Business Schools in the world and MA in Management programme is placed in top 17 best management programmes of Leadership and Management in Southeast Europe.
There is growing evidence about the positive correlation between effective leadership and continuous improvement of the Institution. It is attempted to apply "Leading at Every Level" model to provide faculty and academic leaders with information about the management and leadership expectations, available tools and resources for ongoing learning and professional development. They are prepared for managing and leading others in project or research teams, committees, or while supervising staff members or graduate students. The structure of the Universum College top management act is based on the principles of respect for normative acts, academic freedom, and refraining from political agenda.
During the 2020/2021, Universum College has established a new leadership Department of Innovation and External Relations. Each department consists of an Academic Director (leader) and Programme Coordinator. There exist lists of responsibilities for each of them.

Graduates from the proposed graduate Data Science and Analytics programme should be able to:

- think critically and analyse real problems
- find, evaluate, and use resources
- work collaboratively
- demonstrate versatility
- demonstrate problem solving abilities
- communicate effectively
- function well in a global community
- deal with uncertainty and diversity
- continue learning after graduation

The teaching-learning process is well described in the mentioned Self-evaluation report and should provide proper expected outcomes.

2. PROGRAM EVALUATION

2.1. Mission, objectives and administration

The declared mission of Universum College is to support their students to become good citizens, successful and broad-minded leaders and thrive in Revolution 4.0 of the digital and globalized era.

The Universum College mission is building upon the following strategic pillars:

- Student and Learning at the Centre
- Quality Improvement
- Innovation and Entrepreneurship
- Digital Transformation
- Internationalization

Their institutional objectives are:

- To provide high quality, accessible and affordable educational opportunities to students;
- To encourage personal and social development of students through activities outside the classroom;
- To provide students with an understanding and appreciation of world culture;
- To develop the College as a life-long learning centre;
- To continue development as the most internationalized HEI in Kosovo;

● To continue the development of dual-study programmes with local and international companies;
● To foster applied research that is done in close partnership with the industry;
●To incorporate digital tools in teaching and student learning

The detailed and well-written description of the strategic pillars can be found in PBHE "Universum College", Self-Evaluation report, Programme Evaluation MSc. in Data Science and Analytics, January 2021.

Tables of compliance to standards were copied from the Sample Compliance Calculation but with modified Compliances corresponding to estimations for the Universum MSc. in Data Science and Analytics. The first one is presented below. Before it, a table concerning the same standards is commented.

Standard	**Comment**
Standard 1.1. The study programme mission is in compliance with the overall mission statement of the institution.	
Standard 1.2. Relevant academic and professional advice is considered when defining the intended learning outcomes which are consistent with the National Qualifications Framework and the Framework for Qualifications of the European Higher Education Area.	As the study has to start yet, we have not found any explicit specific advice to be obeyed. It can be only presumed that a better guess for answer would be "YES".
Standard 1.3. The study program has a well-defined overarching didactic and research concept.	Some serious remarks and suggestions related to courses are expressed in the chapter on Education. Rarely any programme is perceived as excellent at its first execution.
Standard 1.4. There are formal policies, guidelines and regulations dealing with recurring procedural or academic issues. These are made publicly available to all staff and students.	We could not properly proof the fulfilment of these requirements for not being able to visit the site physically, nor the education has started yet. We had to rely mostly on the Self-Evaluation document and discussions on the virtual meeting and rely on existing practices.
Standard 1.5. All staff and students comply with the internal regulations relating to ethical conduct in research, teaching, assessment in all academic and administrative activities.	

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Standard 1.6. All policies, regulations, terms of reference and statements of responsibility relating to the management and delivery of the program are reviewed at least once every two years and amended as required in the light of changing circumstances.	We find certain Standard's requirements formulated as "available to **all** staff and students" , "**All** staff and students comply…" and "**All** policies, regulations…" as exaggerated and in practice hardly achievable. We would regard as most successful if instead of the required "all", e.g. only 90% would be satisfied in practice. We shall assume the Compliance answer "YES", even if we suggest relaxing the Standard's requirements – instead of "all", use the term "majority" or something similar. As the study has not started yet we propose "Non applicable"

Standard	**Compliance***	
	Yes	**No**
Standard 1.1. The study programme mission is in compliance with the overall mission statement of the institution.	**X**	
Standard 1.2. Relevant academic and professional advice is considered when defining the intended learning outcomes which are consistent with the National Qualifications Framework and the Framework for Qualifications of the European Higher Education Area.		**X**
Standard 1.3. The study program has a well-defined overarching didactic and research concept.		**X**
Standard 1.4. There are formal policies, guidelines and regulations dealing with recurring procedural or academic issues. These are made publicly available to all staff and students.	**X**	
Standard 1.5. All staff and students comply with the internal regulations relating to ethical conduct in research, teaching, assessment in all academic and administrative activities.	**X**	
Standard 1.6. All policies, regulations, terms of reference and statements of responsibility relating to the management and delivery of the program are reviewed at least once every two years and amended as required in the light of changing circumstances.	**Non applicable**	

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Compliance levels were defined with 4 discrete possible values**:**

- Fully compliant
- Substantially compliant
- Partially compliant
- Non-compliant

using the following guidelines, as required by the KAA Accreditation manual:

1.1. fully compliant – all the standards included in a particular general area are met. If the institution exceeds the standards and meets some of the performance indicators, commendations are appropriate. This recognition provides the institution motivation to pursue even greater levels of excellence in their quality management practices;

1.2. substantially compliant – 70 – 90% of the standards included in a particular general area are met, while the others are not yet in line with stated expectations. Also, there is potential for requirements of the standards not to be satisfied before the next review (examples may include the loss of key faculty members due to retirements, declining student enrolment, or projected reductions in financial or personnel resources, and others);

1.3. partially compliant - 30 – 60% of the standards included in a particular general area are met. Also, the institution lacks the strength of compliance with the standards to ensure that the quality of the institution will not be compromised;

1.4. non-compliant – less than 30% of the standards included in a particular general area are met. The institution does not satisfy the requirements of the standards.

With 3 "YES" and 2 "NO" in the above table measuring the **Mission, objectives and administration** the Compliance level would be 3 /5 = 0.6 or 60%, implying "**Partly compliant**".

ET recommendations:

1. *Introduction of Master studies could be gradually transformed into a multitude of interdisciplinary elective courses, some of them in English to attract primarily foreign, but also some domestic students, producing different profiles of professionals, satisfying ever changing requirements on the labour market. It can be expected that under such conditions, some individuals and groups would excel in their research and become recognised in Europe and the world. Numerous MS and PhD theses can be defended aiming at real-world problems from the environment.*

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2. *Continue with your successful internationalisation efforts, despite possible current obstacles.*

2.2. Quality management

Considering the information gathered during the evaluation visit and the additional information received after the visit, the experts' team agrees that staff participate in self-evaluations and cooperate with reporting and improvement processes in their sphere of activity. While talking to the head of the master's programme, the ET observed awareness of the challenges and how to deal with them. Therefore, the ET can confirm that the evaluation processes and planning for improvement are integrated into normal planning processes. The HEI has developed Staff Handbook. Also, both the HEI and external stakeholders would benefit from a publicly available Quality Policy.

Quality assurance processes at the HEI deal with all aspects of programme planning and delivery, including services and resources provided by other parts of the institution. Quality evaluations offer an overview of quality issues for the overall programme and different components within it.

Survey data are being collected from students, graduates, and employers, but the results of these evaluations are not made publicly available. Only a few of the employers who took part in the visit were able to name some examples of cooperation with the HEI (hackathons). No one was involved in implementing and evaluating the programme (no one had received and filled in any questionnaire from the HEI). Consequently, it can be concluded that cooperation with employers should be expanded, especially in terms of research and valorization. The ET can confirm that the institution ensures that reports on the quality are prepared periodically (yearly), and the results of the internal quality assurance system are considered for the development of the study programme. However, the student workload is not monitored. The quality assurance arrangements at the HEI are regularly evaluated and improved. The quality assurance processes ensure that most of the required standards are met. There is continuous improvement, but the evidence could be better prepared (English language). Overall, the Quality Management at the HEI is on a high level.

Standard	**Compliance**	
	Yes	**No**
Standard 2.1. All staff participate in self-evaluations and cooperate with reporting and improvement processes in their sphere of activity.	**X**	

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Standard 2.2. Evaluation processes and planning for improvement are integrated into normal planning processes.	**X**	
Standard 2.3. Quality assurance processes deal with all aspects of program planning and delivery, including services and resources provided by other parts of the institution.	**X**	
Standard 2.4. Quality evaluations provide an overview of quality issues for the overall program as well as of different components within it; the evaluations consider inputs, processes, and outputs, with particular attention given to learning outcomes for students.	**X**	
Standard 2.5. Quality assurance processes ensure both that required standards are met and that there is continuing improvement in performance.	**X**	
Standard 2.6. Survey data is being collected from students, graduates, and employers; the results of these evaluations are made publicly available.		**X**
Standard 2.7. Results of the internal quality assurance system have been taken into consideration for further development of the study program. This includes evaluation results, investigation of the student workload, academic success and employment of graduates.	**X**	
Standard 2.8. The institution ensures that reports on the overall quality of the program are prepared periodically (e.g., every three years) for consideration within the institution indicating its strengths and weaknesses	**X**	
Standard 2.9. The quality assurance arrangements for the program are themselves regularly evaluated and improved.	**X**	

Compliance level: 8/9 = 0.89 = 89%, Substantially compliant

ET recommendations:

1. *Design and publish Quality Policy.*
2. *Publish the results that represent survey data collected.*
3. *Expand the cooperation with the external stakeholders, e.g., employers, especially in terms of research and valorisation.*
4. *Establish procedures for monitoring and coordinating student workload.*
5. *Conduct a comprehensive reassessment of the programme at least once every five years. Policies and procedures for conducting this reassessment should be published.*

Programme assessment should involve external stakeholders (e.g., experienced people from relevant industries and professions and experienced staff from other institutions).

6. *Design and publish a specific improvement plan interrelated with the survey results (advisable at the study programme level – so the implementation of recommendations could be clearly assessed by the HEI staff and the external reviewers). The improvement plan should clearly indicate the areas as follows: survey results, investigation of the student workload, academic success, and graduates' employment.*
7. *Continue to evaluate and improve the quality assurance arrangements regularly and systematically (once a year). Review of quality assurance arrangements should include both internal and external stakeholders, including students.*
8. *Ensure high engagement of students in their academic life at the HEI.*
9. *The documents used as evidence in the external evaluation process should be prepared in English.*

2.3. Academic staff

A private institution has presumably more freedom than the state-owned ones, to attract and keep excellent teachers. However, the highest academic rank in this field at Universum is currently assistant professor. The situation with staff may deteriorate when Kosovo joins the EU. The brain-drain will be difficult to control. There is no simple cure in this regard, but one should not be taken by surprise. Better financial stimuli for the staff of a private institution can be hardly expected only from tuition in a not too rich country, where good state-owned institutions require no tuition. However, a possibility is to take advantage of the allowed and stimulating Faculty policy to engage in non-trivial scientific and professional projects for local needs.

A hint if the local legislation allows, would be to honour the researchers' financial contributions to the Universum and to their Department, in addition to the standard honouring of publications. We apologise if Universum is already following that practice and we had missed that information.

The fact that Universum can lead its own policy and favour engagement in projects can bring certain advantage compared to state owned universities, while the intrinsic disadvantage is the students' obligation to pay tuition.

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Regarding the staff, a general objection is that their CVs are not presented in the same standardised format. Some of them are partly or only in Albanian. Some mention remarkable achievements, experience and publications, while some have no publications or have missed to mention them.

It appears to be common knowledge that highly educated computer scientists are in short supply, not only in Kosovo but likewise elsewhere. It is for us impossible to check the completion of Standard 3.3. as we cannot dispose of all the higher education data in Kosovo and in vicinity, to check all their simultaneous engagements. As the respective education process has not started yet, we cannot guarantee future fulfilment of standards 3.5 and 3.8. We do not expect them to be fulfilled immediately, and we could not find publicly available academic staff evaluations, except for top achievers.

Standard	Compliance	
	Yes	**No**
Standard 3.1. Candidates for employment are provided with full position descriptions and conditions of employment. To be presented in tabular form data about full time (FT) and part time (PT) academic/ artistic staff, such as: name, qualification, academic title, duration of official (valid) contract, workload for teaching, exams, consulting, administrative activities, research, etc. for the study program under evaluation.	**X**	
Standard 3.2. The teaching staff must comply with the legal requirements concerning the occupation of teaching positions included in the Administrative instruction on Accreditation.	**X**	
Standard 3.3. Academic staff do not cover, within an academic year, more than two teaching positions (one full-time, one part-time), regardless of the educational institution where they carry out their activity.		**X**
Standard 3.4. At least 50% of the academic staff in the study program are full time employees, and account for at least 50% of the classes of the study program.	**X**	
Standard 3.5. For each student group (defined by the statute of the institution) and for every 60 ECTS credits in the study program, the institution has employed at least one full time staff with PhD title or equivalent title in the case of artistic/applied science institutions.		**X**
Standard 3.6. Opportunities are provided for additional professional development of teaching staff, with special assistance given to any who are facing difficulties.	**X**	

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Standard 3.7. The responsibilities of all teaching staff, especially full-time, include the engagement in the academic community, availability for consultations with students and community service.	**X**	
Standard 3.8. Academic staff evaluation is conducted regularly at least through self-evaluation, students, peer and superiors' evaluations, and occur on a formal basis at least once each year. The results of the evaluation are made publicly available.		**X**
Standard 3.9. Strategies for quality enhancement include improving the teaching strategies and quality of learning materials.	**X**	
Standard 3.10. Teachers retired at age limit or for other reasons lose the status of full-time teachers and are considered part-time teachers.	**X**	

Compliance level: 7/10 = 70%, Substantially compliant

ET recommendations:

1. *Enforce scientific and professional co-operation with local industry, economy and other appreciated institutions and organisations.*
2. *Support the Faculty staff initiatives to solve local challenging real-life problems and encourage publishing their achievements in real-life projects, while employed in Universum, as case studies in relevant journals*
3. *Occasionally engage distinguished professionals from industry to provide invited lectures for the students and/or to be co-mentors for students' theses dealing with real-life problems from practice.*

2.4. Educational process content

Based on the textual course descriptions, a table has been produced with comments and suggestions regarding certain courses.

We remind that ECTS points result from estimation of STUDENT's time consumption, not the teacher's.

Course	Comments/suggestions
Business Strategy and Environment	*Weekly plan is missing!*

Data Privacy and Ethics	*Instead of 6 ECTS, 3 or 4 would be more appropriate.*
Data Science for Economics	*Consider possible reduction of ECTS points.* *The course objective to "understand common components of computer algorithms such as conditionals, loops, and function" is redundant for a student who has completed BSc. in Computer science.* *The course learning outcome "Basic knowledge of how computers work and what it implies for computation" is redundant for a student who has completed BSc. in Computer science.* *Weekly plan is missing!*
Deep Learning and Reinforcement Learning	**Week II Linear Algebra** Scalars, Vectors, Matrices and Tensors Multiplying Matrices and Vectors Identity and Inverse Matrices Linear Dependence and Span Norms Special Kinds of Matrices and Vectors Eigendecomposition Singular Value Decomposition The Moore-Penrose Pseudoinverse The Trace Operator The Determinant Example: Principal Components Analysis *The listed topics are important and necessary, but should not the most of it be already known? If not, only Week II cannot be enough!* **Week III Probability and Information** Theory Why Probability? Random Variables Probability Distributions Marginal Probability Conditional Probability The Chain Rule of Conditional Probabilities Independence and Conditional Independence Expectation, Variance and Covariance Common Probability Distributions Useful Properties of Common Functions

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	Bayes' Rule Technical Details of Continuous Variables Information Theory Structured Probabilistic Models . *This could be a complete course, or maybe even two: "Probability" and "Information Theory"* **Week V Machine Learning Basics** Learning Algorithms Capacity, Overfitting and Underfitting Hyperparameters and Validation Sets Estimators, Bias and Variance Maximum Likelihood Estimation Bayesian Statistics Supervised Learning Algorithms Unsupervised Learning Algorithms Stochastic Gradient Descent Building a Machine Learning Algorithm Challenges Motivating Deep Learning *Week V requires a separate course "Machine learning".* **Week VIII** Convolutional Networks The Convolution Operation Motivation Pooling Convolution and Pooling as an Infinitely Strong Prior Variants of the Basic Convolution Function Structured Outputs Data Types Efficient Convolution Algorithms . Random or Unsupervised Features The Neuroscientific Basis for Convolutional Networks Convolutional Networks and the History of Deep Learning Sequence Modelling: Recurrent and Recursive Nets Unfolding Computational Graphs Recurrent Neural Networks Bidirectional RNNs Encoder-Decoder Sequence-to-Sequence Architectures

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	Deep Recurrent Networks Recursive Neural Networks The Challenge of Long-Term Dependencies Echo State Networks . Leaky Units and Other Strategies for Multiple Time Scales The Long Short-Term Memory and Other Gated RNNs Optimization for Long-Term Dependencies Explicit Memory Practical Methodology 416 11.1 Performance Metrics Default Baseline Models Determining Whether to Gather More Data Selecting Hyperparameters Debugging Strategies Example: Multi-Digit Number Recognition *Week VIII may also require a separate full course.* *In the course syllabus only 8 weeks were described. Even if each of these weeks expands to a fortnight, it* ***cannot be enough for students to master*** *without previous knowledge. If the previous knowledge existed, then it would be unnecessary overlapping.* *Absurdity of the current proposal can be demonstrated by comparing this course with the course Data Privacy and Ethics. Can anybody believe that they require the same amount of students' time?*
Distributed Big Data Analytics	*Weekly plan is missing!*
Distributed Systems	*Weekly plan is missing!*
Marketing Management	*4-5 ECTS would be enough.*
Mathematics for Data Science	*The declared main objectives of the course overlap with course* Deep Learning and Reinforcement Learning. *The topics mentioned in* Deep Learning and Reinforcement Learning ***should be dramatically reduced and taught in*** **Mathematics for Data Science**. *A serious* ***synchronisation effort*** *between courses is indispensable!*
Project Management	*Week 10 contains* ***most of the concrete contents of the whole course****. A single week is hardly enough. What about limited resources, consumable and reusable? Updating of the plan through time. Earliest and latest*

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	times, different floats. Drawing of network plans and Gantt charts, critical activities, etc. *Most weeks before that can be concentrated into one or two introductory weeks by reducing excessive narrative issues.*
Research Seminars and Methodology	*These weeks contain important topics which predominantly belong to a course on Statistics and are generally necessary* ***much earlier*** *in the programme*: WEEK 8: Central Tendency This course includes lectures on central tendency. The following topics will be covered: computing mean, median, and mode. WEEK 9: Variation This course includes lectures on variation. The following topics are covered: range; variance; and standard deviation. WEEK 10: Correlation and Regression Tests This course includes lectures on correlation and regression. The following topics are covered: correlation (the form, direction, and strength of the relationship; Pearson Correlation; Spearman Correlation; interpreting correlation); and regression (slope and intercept; interpreting regression). WEEK 11: Hypothesis Testing and z-tests This course includes lectures on testing the hypothesis and computing z-tests. The following topics are included: the five steps to testing a hypothesis; one-sample z-test; the level of significance; critical value; p-value; confidence interval; making decisions to reject or accept the null hypothesis.
Semantic Data Web Technologies	*Weekly planning is missing!*

The above table sufficiently demonstrates a serious weakness of the proposed programme. The teachers appear to be very competent, appropriate knowledge that the students should master was proposed, everything fits, except the co-ordination among the courses' syllabi. The proposed syllabus includes infeasible heavily overloaded course executions and at the same time abundant overlapping among courses is present. The constitutive granules of knowledge

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seem to be well selected, but not properly placed into courses. It should not be an impossible task to reorder the granules and produce a good and feasible educational plan in a rather short time.

Self-evaluation report states that as required by Standard 5.1, Universum employs a clear and formally adopted procedure of students' requirement for this respective study program. Eligible candidates for admission to the College's courses are set out in the General Entry Requirements contained in the Prospectus. Unfortunately, we could not find that "Prospectus" nor the text it contained.

The problem arises due to Universum's wish that different profiles of students be welcome to enrol in MSc *Study of Data Science and Analytics*. This attempt has solid and understandable motives, the problem of lacking background knowledge has been recognised in the Self-evaluation report but efficient measures to resolve it are not provided. One cannot neglect that students from other fields may significantly lack knowledge of mathematics, statistics, and programming. These are not simple subjects. For comparison, we bring excerpts cited from the *North Carolina State University* (NCSU) study of Data science and Analytics, https://analytics.ncsu.edu/?page_id=123 (accessed on 22 April 2021), probably among the best in the world:

"The Master of Science in Analytics (MSA) is a novel curriculum aimed squarely at producing graduates with the multi-faceted skills needed to draw insights from complex data sets, and to be able to communicate those insights effectively. It is the product of a 3-year collaboration by an interdisciplinary group including mathematicians, computer scientists, statisticians, economists, geographers, operations researchers, and faculty with expertise in various fields of business and management…"

It results that their aim is very similar to the Universum's. However, they have probably dedicated much more of their time for preparation, and they do not neglect the problem of homogenising the student population' prerequisite knowledge, as can be seen in site https://analytics.ncsu.edu/?page_id=906 (accessed on 22 April 2021):

"*Before matriculating, applicants must have completed a bachelor's degree from an accredited college or university and have a proven track record of strong academic performance. It is not uncommon for applicants to already hold advanced degrees (MS, MBA, PhD, etc.)*

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We accept applicants from a wide variety of academic majors. ***However, to be a competitive applicant, you will need to have successfully completed prerequisite courses*** *prior to or concurrent with your application for admission to the MSA program.*"

"*Prerequisite courses for applicants include at least one, but ideally* ***two semesters of college-level statistical methods****, including substantive coursework covering regression analysis. To gauge whether courses you have taken previously (or are considering taking in the future) would serve as sufficient preparation, please compare their content against the topics/methods listed below*:

Statistical topics/methods your prerequisite course(s) should cover:

Analysis of Variance (ANOVA)
Confidence Intervals
Correlation
Data Collection / Sampling
Eigenvalues / Eigenvectors
Gauss-Jordan Elimination
Hypothesis Testing
Least Squares Estimation / Normal Equation
Matrix Manipulation
…
…

An additional requirement of MSA admission is the ability to code in one or more ***computer programming*** *languages, especially those most relevant to the MSA program (Python, R, SAS, and SQL)…."*

We have significantly shortened the cited list of prerequisites. We had to stop citing the NCSU web site, in order not to violate possible copyright issues, although it is a publicly available text. It is recommended to read it in full on their web site.

NCSU dedicate a full year for gaining prerequisite knowledge, while in Universum's proposal this knowledge is inserted in regular courses. Such quantity of knowledge, if not familiar

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beforehand, is impossible to master in a few weeks. On the other hand, there is overlapping, and excessive time would be dedicated to simpler and/or recycled topics.

Standard	Compliance	
	Yes	**No**
Standard 4.1. The study program is modelled on qualification objectives. These include subject-related and interdisciplinary aspects as well as the acquisition of disciplinary, methodological and generic skills and competencies. The aspects refer especially to academic or artistic competencies, to the capability of taking up adequate employment, contributing to the civil society and of developing the students' personality.	**X**	
Standard 4.2. The study program complies with the National Qualifications Framework and the Framework for Qualifications of the European Higher Education Area. The individual components of the program are combined in a way to best achieve the specified qualification objectives and provide for adequate forms of teaching and learning.		**X**
Standard 4.3. The disciplines within the curriculum are provided in a logical flow and meet the definition and precise determination of the general and specific competencies, as well as the compatibility with the study programs and curricula delivered in the EHEA. To be listed at least 7 learning outcomes for the study program under evaluation.		**X**
Standard 4.4. The disciplines within the curriculum have analytical syllabuses which comprise at least the following: the discipline's objectives, the basic thematic content, learning outcomes, the distribution of classes, seminars and applicative activities, students' assessment system, the minimal bibliography, etc. The full course description/ syllabuses of each subject/ module should be attached only in electronic form to the self-assessment report for the study program under evaluation.		**X**
Standard 4.5. If the language of instruction is other than Albanian, actions are taken to ensure that language skills of both students and academic staff are adequate for instruction in that language when students begin their studies. This may be done through language training prior to the commencement of the program.		**X**
Standard 4.6. The student-teacher relationship is a partnership in which each assumes the responsibility of reaching the learning outcomes. Learning outcomes are explained and discussed with students from the perspective of their relevance to the students' development.	**X**	
Standard 4.7. Teaching strategies are fit for the different types of learning outcomes programs are intended to develop. Strategies of teaching and		**X**

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assessment set out in program and course specifications are followed with flexibility to meet the needs of different groups of students.		
Standard 4.8. Student assessment mechanisms are conducted fairly and objectively, are appropriate for the different forms of learning sought and are clearly communicated to students at the beginning of courses.	**X**	
Standard 4.9. Appropriate, valid and reliable mechanisms are used for verifying standards of student achievement. The standard of work required for different grades is consistent over time, comparable in courses offered within a program, and in comparison with other study programs at highly regarded institutions.	**X**	
Standard 4.10. Policies and procedures include actions to be taken in to dealing with situations where standards of student achievement are inadequate or KAA inconsistently assessed.		**X**
Standard 4.11. If the study program includes practice stages, the intended student learning outcomes are clearly specified, and effective processes are followed to ensure that those learning outcomes and the strategies to develop that learning are understood by students. The practice stages are allocated ETCS credits and the work of the students at the practical training organisations is monitored through activity reports; students during practice stages have assigned tutors among the academic staff in the study program.	**X**	
Standard 4.12. In order to facilitate the practice stages, the higher education institution signs cooperation agreements, contracts or other documents with institutions/organisations/practical training units.	**X**	

Compliance = 6/12 = 50%, Partly compliant

ET recommendations:

1. *Some recommendations regarding single courses are contained in the first table in this chapter on Education.*
2. *Serious problem would arise if enrolling students with weak knowledge of prerequisite mathematics and statistics. If a serious revision of syllabus is not possible in disposable time, restrict the possibility for enrolment to candidates with a degree in Statistics or Mathematics, but preferably in Computer science. Other students would hardly be able to follow the current programme and that may harm the image of the Study and of Universum.*
3. *Consider offering a new extracurricular course "Probability and Statistics" to applicants for enrolment who lack this knowledge.*

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4. *The syllabus requires serious revision and co-ordination effort among the courses, considering prerequisite knowledge for making students able to understand certain topics.*
5. *Avoid overlapping, repeating and waste of time on simpler topics, presumably already familiar to students.*

2.5. Students

As the study has not started yet, there are no active students so this chapter may be omitted.

2.6. Research

Universum states in the Self-evaluation report that it is not a research-intensive institution, but it sees itself primarily as a teaching institution. The research however does take place. It reflects the current strengths of the institution and illustrates how applied research is used to strengthen the study programmes and to keep their curriculum up to date with the most recent developments in respective industries. Universum's strategic investment plan foresees to increase the research fund to comply with the needs of the current labour market. They intend further expansion of their research range, quality, and products.

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Universum declares to be implementing an integrated teaching, research, and staff development policy by making it obligatory for staff to spend a substantial proportion of their working time in conducting research. This will give students the opportunity to participate in ongoing research along with their teachers. Focus will be on applied research and creation of knowledge.

To prepare industry-ready graduates, relevant job-specific skills are needed, provision of appropriate industry engagement, understanding of responsibilities and practice of working in the respective industry. The College designs programmes that provide students with practical learning opportunities, while having direct contact with industries and including research activities paired with publishing opportunities.

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The above Universum's statements are a sound base for further activities. The already achieved wide co-operation abroad and in Kosovo is a proof that the applied strategy is effective and efficient.

More publications could be expected but it is important to maintain the practice that concrete relevant research is the principal goal and publications are a by-product of it, and not the research's only goal. It must be mentioned that some of the most productive researchers have spent considerble time abroad and published mostly there, while not being affiliated to Universum.

Standard	Compliance	
	Yes	**No**
Standard 6.1. The study program has defined scientific/applied research objectives (on its own or as part of a research centre or interdisciplinary program), which are also reflected in the research development plan of the institution; sufficient financial, logistic and human resources are allocated for achieving the proposed research objectives.	**X**	
Standard 6.2. Expectations for teaching staff involvement in research and scholarly activities are clearly specified, and performance in relation to these expectations is considered in staff evaluation and promotion criteria.	**X**	
Standard 6.3. Clear policies are established for defining what is recognized as research, consistent with international standards and established norms in the field of study of the program.	**X**	
Standard 6.4. The academic staff has a proven track record of research results on the same topics as their teaching activity.	**X**	
Standard 6.5. The academic and research staff publish their work in speciality magazines or publishing houses, scientific/applied/artistic products are presented at conferences, sessions, symposiums, seminars etc. and contracts, expertise, consultancy, conventions, etc. are provided to partners inside the country and/or abroad.		**X**
Standard 6.6. Research is validated through: scientific and applied research publications, artistic products, technological transfer through consultancy centres, scientific parks and other structures for validation.	**X**	
Standard 6.7. Each academic staff member and researcher has produced at least an average of one scientific/applied research publication or artistic outcome/product per year for the past three years.		**X**
Standard 6.8. Academic and research staff publish under the name of the institution in Kosovo they are affiliated to as full time staff.		**X**

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Standard 6.9/6.8. Academic staff are encouraged to include in their teaching information about their research and scholarly activities that are relevant to courses they teach, together with other significant research developments in the field.	**X**	
Standard 6.10. Policies are established for ownership of intellectual property and clear procedures set out for commercialization of ideas developed by staff and students.	**X**	
Standard 6.11. Students are engaged in research projects and other activities.	**X**	

Compliance level: 8/11 = 73%, Substantially compliant

ET recommendations:

1. *Make sure that all the full time employed academic staff publishes under the name of the Universum.*
2. *Encourage academic staff to include in their teaching information about their research and scholarly activities that are relevant to the study courses they teach, together with other significant research developments in the field.*
3. *Define procedures for the commercialization of ideas developed by staff and students (Intellectual Property Policy).*
4. *Develop mechanisms for students' engagement in applied research projects and other activities, monitor the outputs, outcomes, and impact.*
5. *Continue with successful policy of international co-operation, enforce research with colleagues in other institutions and in the international community, and monitor the outputs, outcomes, and impact.*
6. *Consider the organization of scientific sessions with the involvement of teaching staff, researchers, students, and graduates.*
7. *Consider further enforcing of strategies for identifying and capitalizing on the expertise of teaching staff and students in providing research and development services to the community.*
8. *Consider monitoring and supporting staff's contribution to attracting financial resources through applied projects and products. Consider including the staff's capacity to generate such financial returns in the individual performance review system.*

2.7. Infrastructure and resources

Unfortunately, we could not observe the Faculty premises in situ, but according to multiple sources, they seem to be excellent.
Qualitative aspects from Standard 7.1. are not satisfactory as elaborated in the chapter 2.4. Educational process content.
Having in mind intrinsic economic instabilities and unexpected problems on the global level, like the current COVID-19 pandemic, hardly can anybody guarantee the Standard 7.2 fulfilment in three years from now.
We suppose that the requests in 7.5. cannot be satisfied to each detail but we estimate that "YES" prevails. Literature in domestic language usually is lacking, but learning English is a necessity.

Standard	Compliance	
	Yes	**No**
Standard 7.1. The adequate long-term implementation of the study program is ensured in quantitative terms as regards premises, human resources and equipment. At the same time, it is guaranteed that qualitative aspects are also taken into account.		**X**
Standard 7.2. There is a financial plan at the level of the study program that would demonstrate the sustainability of the study program for the next minimum three years.		**X**
Standard 7.3. The higher education institution must demonstrate with adequate documents (property deeds, lease contracts, inventories, invoices etc.) that, for the study program submitted for evaluation it possesses the following, for the next at least three years: a) owned or rented spaces adequate for the educational process; b) owned or rented laboratories, with the adequate equipment for all the compulsory disciplines within the curriculum, wherever the analytical syllabus includes such activities; c) adequate software for the disciplines of study included in the curriculum, with utilisation licence; d) library equipped with reading rooms, group work rooms and its own book stock according to the disciplines included in the curricula.	**X**	
Standard 7.4. The number of seats in the lecture rooms, seminar rooms and laboratories must be related to the study groups' size (series, groups, subgroups); the applicative activities for the speciality disciplines	**X**	

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included in the curricula are carried out in laboratories equipped with IT equipment.		
Standard 7.5. The education institution's libraries must ensure, for each of the study programs: a) a number of seats in the reading rooms corresponding to at least 10% of the total number of students in the study program; b) a number of seats in the group work rooms corresponding to at least 10% of the total number of students in the study program; c) their own book stock from Albanian and foreign speciality literature, enough to cover the disciplines within the curricula, out of which at least 50% should represent book titles or speciality courses of recognised publishers, from the last 10 years; d) a book stock within its own library with a sufficient number of books so as to cover the needs of all students in the cycle and year of study the respective discipline is provided for; e) a sufficient number of subscriptions to Albanian and foreign publications and periodicals, according to the stated mission.	**X**	
Standard 7.6. The infrastructure and facilities dedicated to the implementation of the program is adapted to students with special needs.	**X**	

Compliance = 4/6 = 67%, Substantially compliant

ET recommendations:

1. *Missing literature in Albanian should not be regarded as a serious problem. It can happen that while a textbook is being translated, it becomes obsolete. Nowadays, practically every professional in Computing must be fluent in English and able to work in international environment. If necessary, provide additional courses in English.*
2. *Try to attract foreign students by holding some lectures in English. Some of your students would probably eagerly attend lectures in English. However, mother tongue should never be neglected, regardless of seemingly rational advantages of using only English.*

3. OVERALL EVALUATION AND RECOMMENDATION OF THE ET

Due to the COVID-19 pandemic we could not be physically present at the Institution, so we had to rely more on written materials and meetings via video link.

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We gave same recommendations in each of the chapters. Our impression is globally positive. If you continue keeping the motivation high and by attracting the best student population and by promoting co-operation with local industry but also with institutions and companies abroad, using possibility to work on-line, the study has favourable perspective.
International co-operation, schooling and working abroad are very useful and usually attractive so that our most important recommendation would be to motivate your outgoing quality staff and students to plan a return to their homeland, making it more prosperous.

Overall compliance:

Standard	Compliance level
1. Mission, objectives and administration	Partly compliant
2. Quality management	Substantially compliant
3. Academic staff	Substantially compliant
4. Educational process content	Partially compliant
5. Students	Non applicable
6. Research	Substantially compliant
7. Infrastructure and resources	Substantially compliant
Overall compliance	**Substantially compliant**

According to the KAA Accreditation manual, in order to be granted a positive decision for program re/accreditation, every education provider has to demonstrate at least a **substantial compliance** level in the overall judgment. Therefore, failure in meeting at least an overall substantial compliance level entails delaying, withdrawing, suspending or denying accreditation.

In conclusion, in line with the Manual requirements, the Expert Team recommends **to accredit** the program.

In conclusion, the Expert Team considers that according to our knowledge and information Universum is an excellent, well internationally connected institution, but we found serious objections to the proposed study syllabus.

Any loss of time and momentum in introducing the proposed study would harm the Institution. The Expert Team believes that the proposed programme can proceed most favourably under condition that only up to **75** students **holding degree in Computer Science** or in a very close

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discipline, can be enrolled yearly in the study during the first **3** years. Under this condition we find that **MSc. in Data Science and Analytics** offered by **PBHE "Universum College"** is ***Substantially compliant***, with the standards included in the *KAA Accreditation manual* and, therefore, recommend *to* ***accredit*** the study programme for a duration of ***3 years*** with a number of **75** students to be enrolled in the programme each year.

We believe that after that period, or even earlier, Universum can propose a significantly revised educational programme which would be suitable to accept a larger number of differently profiled students, providing them ways to master the required prerequisite knowledge.

Expert Team

Chair

Professor emeritus Damir Kalpić, PhD 4 May 2021

(Signature) (Print Name) (Date)

Member

Mr. Mikus Dubickis 4 May 2021

(Signature) (Print Name) (Date)

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