

ПРОГРАММА ВСТУПИТЕЛЬНОГО ИСПЫТАНИЯ

для поступающих на основную образовательную программу магистратуры
«Бизнес-аналитика и большие данные (Master in Business Analytics and Big Data - MiBA)»
по направлению подготовки 38.04.02 «МЕНЕДЖМЕНТ»,

по предмету «Деловые коммуникации (Бизнес-аналитика и большие данные
(Master in Business Analytics and Big Data - MiBA))»

Program for “Business Communications (“Master in Business Analytics and Big Data” (MiBA))” Entry Examination

“Master in Business Analytics and Big Data” (MiBA),

SECTION I. THE CONTENT OF EXAMINATION

Entry examination (EE) comprises of the written part (40%) and oral part (interview) (60%).

The examination is performed with the use of distant technologies (online) in a synchronous mode.

WRITTEN PART

The goal of the written part of the EE is to assess the level of the candidates' prerequisite understanding of the program-specific theory and level of possession of the program specific vocabulary in the program language that is necessary for successful studies according to the master program requirements.

Written part implies answering to 5 questions in total.

Questions for the written part are based on one or more of the following themes.

Written part themes (for more detailed instructions on themes coverage, please, see Appendix 1).

1. Data types and sampling.
2. Data storage and databases.
3. Data governance.
4. Big data concept.
5. Business Intelligence
6. Classical hypothesis testing: types and procedures.
7. Econometrics.
8. Data-driven decision making.
9. Machine learning.
10. Deep learning.

Examples of questions:

1. How correlation and linear regression are applied in management practice? Support your answer with both conceptual and practical arguments.
2. Explain how quantitative methods of analysis may support decision making under risk and uncertainty. Supply your answer with examples.

3. What is Bayesian probability and how is it used in dealing with uncertainty in economics and management?

ORAL PART (Interview)

The goal of the *oral part* of the EE is to assess the candidates' readiness for professional oral communication in the program language, personal competencies and skills.

Candidates are assessed by 3 key criteria/competency:

- *Motivation to Achieve Results* (Competency 1) requires that the candidate strives for results and is capable to adapt his/her priorities in the process of performance. The candidate plans actions, pursues goals and can articulate those when making choices. The basis for assessment – presentation of candidate's motivation to enter the programs.
- *Effective Communication* (Competency 2) requires well-developed communication skills and an ability to express one's thoughts clearly and confidently, to transmit information precisely, to present arguments effectively, and to possess an ability to persuade others.
- *Analytical Abilities* (Competency 3) require an ability to locate urgent or potentially important areas of research, an ability of profound analysis and/or of development of a deep interest in analytical work. The candidate needs to demonstrate analytical thinking – ability to break down complex information into its parts to understand its underlying structure, as well as critical thinking – ability to analyze facts objectively and form a judgement.

SECTION II. RECOMMENDED LITERATURE

1. David R. Anderson, Dennis J. Sweeney, Thomas A. Williams. Statistics for business and economics. 9th ed. Mason, OH : Thomson/South-Western, 2005.
2. David M. Levine, David F. Stephan, Kathryn A. Szabat. Statistics for Managers using Excel. 8th ed. 2016.
3. Saaty T.L. Fundamentals of decision making, RWS Publications, Pittsburgh, 1994 Taha H. Operations Research: An Introduction. 9th ed. 2010.
4. Ron Kohavi, Diane Tang, Ya Xu. Trustworthy Online Controlled Experiments: A Practical Guide to A/B Testing. 1st edition, 2020.
5. EMC Education Services, Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data. 1st edition, 2015.
6. Efraim Turban, Carol Pollard, Gregory Wood. Information Technology for Management: Driving Digital Transformation to Increase Local and Global Performance, Growth and Sustainability. 12th Edition, 2021.
7. DAMA International. The DAMA Guide to the Data Management Body of Knowledge (DAMA-DMBOK). 2009
8. Andriy Burkov. The Hundred-Page Machine Learning Book. 2019. Andriy Burkov. The Hundred-Page Machine Learning Book. 2019

III. METHODOLOGY

The structure of the Entry Examination is the following:

Written part (5 questions)	40 points (%)
Oral part (Interview)	60 points (%)

Written part is performed first.

Procedure for the written part:

- Written part is performed on the electronic platform approved by SPbU.
- Written part is performed with proctoring.
- Neither hard copy nor electronic/online materials are allowed for usage during examination (including glossaries and vocabularies).
- A candidate is to answer to 5 questions.
- Exam duration: 30 minutes.

Oral part (Interview) is carried out via video-conference application approved by SPbU (may differ from the one used for the written part) by 2-5 examiners at one time (may include academicians and practitioners or academicians only).

Procedure for the oral part:

- Interviews start after a short break following the written part and according to schedule planned by the Admissions office.
- Length: 20-30 minutes for the interview (including 5 minutes for self-presentation), then after the candidate is dismissed – 2-5 minutes for examiners' discussion and decision on the grade.
- The material for discussion is self-selected and home-prepared by the candidate. No extra time for preparation is needed.
- Interviews are conducted in English.
- The interview starts with the candidate's self-presentation (points to be covered: statement of the motivation to enter the selected program and perspective career development that the program offers; formulation of the key interests in the field of the selected program; presentation of a successful case where analytical abilities of a candidate can be demonstrated). Then examiners ask questions related to the declared points and (if needed) on other aspects in order to assess the criteria.
- The EE is totally anonymous.
- For analytical abilities competencies checking, candidates can be asked to analyze mini-case. Here are mini-case examples:
 - Discuss what is wrong with the following statistic: the Volvo is the safest car on the road because a recent study has shown that Volvos have the fewest number of accident deaths per mile driven.
 - A fast food company is thinking about putting a franchise in an airport. They hire you to see if they should do so.
 - A car company is interested in developing a new car. What marketing related issues should it consider before doing so?
 - An airline finds that, while its revenues are high, the company is still operating at a loss. What is going on?"
- Independently of the number of applications oral part will be performed only once.

IV. ASSESSMENT CRITERIA

The maximum score for the Entry Examination is 100 % (points).

Total result is calculated as a sum of points for the written and oral parts.
There are no minimum points for separate parts.

Each part is assessed in points that are further converted in the total score according to the weights:

The written part – 40% (points) of the total score for the Entry Examination.

The oral part – 60% (points) of the total score for the Entry Examination.

If an applicant applies to any 2 or 3 programs of the following master's degree programs in the field of study 38.04.02 «МЕНЕДЖМЕНТ»:

1. «Корпоративные финансы (Master in Corporate Finance - MCF)»;
2. «Менеджмент (Master in Management - MIM)»;
3. «Бизнес-аналитика и большие данные (Master in Business Analytics and Big Data - MiBA)»;

then the oral part of the entry examination is taken only once and its result is automatically counted for all programs from the list above to which the admission application was submitted.

Assessment of the written part:

Each correct and complete answer gives 8 points.

Therefore, the maximum score for the written part (for 5 questions) is 40 points.

Criteria for the written part:

Main criteria (for each question)	Max points	Sub-criteria	Points
Completeness of the answer	3	All relevant points are covered without any remarks	3
		There are small lacks in the answer, but almost all key points are covered and examples are provided	2
		Half or more key points are missed, or some key points are missed and no examples are provided with theoretical aspects fully covered	1
		Irrelevant or no answer	0
Logic of the answer	2	The answer is logical and coherent	2
		The answer is not well structured OR coherence is missing	1
		Irrelevant or no answer	0
Understanding of the topic	3	The answer is sufficient and demonstrates a good understanding of the topic in question	3
		The answer is sufficient and demonstrates understanding of	2

		basic points of the topic in question	
		The answer demonstrates lacks in understanding of basic theoretical approaches to the topic in question	1
		There is no understanding of basic theoretical points of the topic OR there are significant mistakes in it	0
Total	8		

Assessment of the oral part:

Criteria for the oral part:

№1. Motivation to Achieve Results

Max points	Competency Level	Description	Candidate's Interview Outcome
5	Excellent	Corresponds to the majority (90 % and up) of the competency definitions	Strong demonstrating of the competency reflected in showcasing of the majority (90% and up) of the required behavioral characteristics.
4	Very Good	Corresponds to more than a half of the competency definitions	The demonstrated strong behavioral characteristics prevail over the number of weak behavioral characteristics.
3	Good	Corresponds to a half of the competency definitions	Demonstration of a strong presence of a half of the required behavioral characteristics and of weak/insufficient presence of the other behavioral characteristics.
2	Next- to- Low ("minimal")	Corresponds to less than a half of the competency definitions	Insufficient demonstration of the majority of the required behavioral characteristics.
1	Low	Doesn't correspond next-to-neither of the definitions of the competency	Demonstrated weak/insufficient level of the competency. No strong points were demonstrated.
0	Absence of any proof	Absence of any demonstrated competency definition	No traces of any required behavioral characteristics were demonstrated.

№ 2. Effective Communication

Max points	Competency Level	Description	Candidate's Interview Outcome
5	Excellent	Corresponds to the majority	Strong demonstrating of the

		(90 % and up) of the competency definitions	competency reflected in showcasing of the majority (90% and up) of the required behavioral characteristics.
4	Very Good	Corresponds to more than a half of the competency definitions	The demonstrated strong behavioral characteristics prevail over the number of weak behavioral characteristics.
3	Good	Corresponds to a half of the competency definitions	Demonstration of a strong presence of a half of the required behavioral characteristics and of weak/insufficient presence of the other behavioral characteristics.
2	Next- to- Low (“minimal”)	Corresponds to less than a half of the competency definitions	Insufficient demonstration of the majority of the required behavioral characteristics
1	Low	Doesn’t correspond next-to-neither of the definitions of the competency	Demonstrated weak/insufficient level of the competency. No strong points were demonstrated.
0	Absence of any proof	Absence of any demonstrated competency definition	No traces of any required behavioral characteristics were demonstrated.

№ 3. Analytical Abilities

Max points	Competency Level	Description	Candidate’s Interview Outcome
5	Excellent	Corresponds to the majority (90 % and up) of the competency definitions	Strong demonstrating of the competency reflected in showcasing of the majority (90% and up) of the required behavioral characteristics.
4	Very Good	Corresponds to more than a half of the competency definitions	The demonstrated strong behavioral characteristics prevail over the number of weak behavioral characteristics.
3	Good	Corresponds to a half of the competency definitions	Demonstration of a strong presence of a half of the required behavioral characteristics and of weak/insufficient presence of the other behavioral characteristics.
2	Next- to- Low (“minimal”)	Corresponds to less than a half of the competency definitions	Insufficient demonstration of the majority of the required behavioral characteristics.
1	Low	Doesn’t correspond next-to-neither of the definitions of the competency	Demonstrated weak/insufficient level of the competency. No strong points were demonstrated.
0	Absence of any proof	Absence of any demonstrated competency definition	No traces of any required behavioral characteristics were demonstrated.

Conversion scale:

Points gained	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Score for the final grade	0	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60

Therefore, the maximum score for the oral part (for 3 criteria) is 60 points.

Program for “Business Communications (Master in Business Analytics and Big Data (MiBA))”
Entry Examination in 2025
APPENDIX 1

Written part themes coverage

	Question	Includes:
1.	Data types and sampling.	Data types and collection methods. Usage and examples. Population and sampling, sampling methods. Examples of methods that are applicable for each data types.
2.	Data storage and databases	Data collection and storage. Data load and extraction. Data Warehouse. Data lake.
3.	Data governance	Data management. Data security. Data Quality. Data Architecture. Data modeling and design.
4.	Big data concept.	History and characteristics of Big Data. Big data technologies. Applications of big data.
5.	Business Intelligence	BI history. Main components of BI: reporting and dashboard, OLAP, data mining.
6.	Classical hypothesis testing: types and procedures.	Statistical hypothesis: examples. Types of hypothesis tests. Hypothesis testing: algorithm and example.
7.	Econometrics	Panel data. Correlation: calculation and interpretation. Regression analysis: simple linear regression, logistic regression, model estimation and quality. Interpretation and significance of results.
8.	Data-driven decision making.	Business understanding. Methods and approaches for data-driven decision making. Tools for business analytics. A/B testing. Experiment design.
9.	Machine learning	Regression and classification problem. Machine learning methods. Evaluation metrics. CRISP-DM methodology.
10.	Deep learning	Neural networks. Computer vision and natural language processing. Business applications. Ethics in deep learning.