

<b>Name of the entrance exam</b>
Business Engineering
<b>Field/fields of study</b>
38.04.05 Business Informatics
<b>Educational program/programs</b>
38.04.05_02 Business Engineering (International Educational Program)
<b>Abstract</b>
<p>The program includes a list of topics (questions) on subject of the basic part of the professional block in the field 38.03.05 Business Informatics, which are included in the content of the admission exam for the master's program. The admission exam is evaluated on a 100-point scale and consists of three blocks:</p> <ul style="list-style-type: none"> <li>- Business Process Modeling;</li> <li>- Information Systems Life Cycle Management;</li> <li>- Project Management.</li> </ul> <p>The minimum number of points confirming its successful completion is set by the Admission Rules approved for the current academic year. The test duration is 60 minutes.</p>
<b>Disciplines included in the program of entrance examinations for the Master's degree program</b>
<ol style="list-style-type: none"> <li>1. Business Process Modeling</li> <li>2. Information Systems Life Cycle Management</li> <li>3. Project Management</li> </ol>
<b>Content of academic disciplines</b>
<p>Business Process Modeling:</p> <ol style="list-style-type: none"> <li>1. Advantages of the process approach to managing an organization</li> <li>2. Basic definitions of the process approach.</li> <li>3. Function-oriented and process-oriented organizations.</li> <li>4. The concept of a business process.</li> <li>5. Process approach and process management cycles.</li> <li>6. Theoretical foundations of process management</li> <li>7. Systematic approach. Organization as a system. Subsystems of the organization.</li> <li>8. Structural analysis.</li> <li>9. Concept of Business Process Management. Life cycle of process management in BPM.</li> <li>10. Process and its components.</li> <li>11. Properties of processes.</li> <li>12. Classification of processes.</li> <li>13. The concept of modeling activities and modeling business processes of an organization.</li> <li>14. General principles of modeling.</li> <li>15. The concept of business process modeling methodology.</li> <li>16. Classification of methodologies.</li> <li>17. Concepts of model, model object and connection.</li> <li>18. Use of standard and reference models.</li> <li>19. Selection of methodology and instrumental system for modeling business processes.</li> <li>20. IDEF methodology.</li> <li>21. Objects and connections in IDEF0.</li> <li>22. Rules for the design of diagrams.</li> <li>23. Purpose of the IDEF3 methodology.</li> <li>24. Purpose of DFD methodology.</li> <li>25. ARIS methodology.</li> <li>26. Main types of models and notations in the ARIS methodology.</li> <li>27. BPMN methodology.</li> <li>28. Models of strategic planning. BSC method.</li> <li>29. Event Process Chain (EPC).</li> <li>30. Description of the organizational structure.</li> </ol> <p>Study Literature:</p> <ol style="list-style-type: none"> <li>1. Body of knowledge on business process management BPM CBOK 4.0. Alpina Publisher, Moscow. 2022.</li> <li>2. V.G. Eliferov, V.V. Repin. Business processes. Regulation and management // Institute of Economics and Finance "Synergy", 2021.</li> <li>3. <a href="http://www.aris-portal.ru">http://www.aris-portal.ru</a>– website dedicated to the ARIS methodology.</li> <li>4. <a href="http://www.idef.ru">http://www.idef.ru</a>– website dedicated to the IDEF methodology.</li> <li>5. <a href="http://www.bpmn.org/">http://www.bpmn.org/</a>- a site dedicated to the BPMN methodology.</li> </ol> <p>Information Systems Life Cycle Management:</p> <ol style="list-style-type: none"> <li>1. Information needs of the enterprise.</li> <li>2. Definition of information process, information technology, information system.</li> <li>3. Basic concepts of information systems.</li> </ol>

4. Characteristics of information systems.
5. Properties of information processes, systems and networks.
6. Information transmission and processing systems.
7. Economic automated information systems.
8. Classes of information systems design technologies.
9. Life cycle models of information systems.
10. Development of an information system in accordance with the requirements
11. GOST 34. Stages and stages of development.
12. Tools for computer-aided design of information systems.
13. Methodologies for modeling the subject area. Development of functional models in toplevel notations (DFD).
14. Methodologies for modeling the subject area. Modeling work flows using low-level notations (WFD).
15. Modeling of IS information support. Rules for constructing ER diagrams.
16. Stages of the life cycle of information systems.
17. Standard and original IC design.
18. Basics of the RUP methodology.
19. Corporate methodologies for implementing IS (methodologies for introducing standard IT solutions from Microsoft, SAP SE, 1C).
20. Characteristics of IT services.
21. Basic ITIL/ITSM processes.
22. Basics of building corporate information systems.
23. Principles of building corporate information systems.
24. Goals and objectives of corporate information systems.
25. General overview of ERP systems.
26. Generation of ERP systems: overview of functionality, role in increasing enterprise management efficiency.
27. Review of CRM, SCM and PLM systems.
28. Electronic document management systems.
29. Internet services.
30. Enterprise architecture structure.

#### Study Literature:

1. Kosinenko N.S. Information systems and technologies in economics [Electronic resource]: textbook / Kosinenko N.S., Friesen I.G.—Electron. text data. - Moscow: Dashkov and K, IP Er Media, 2017. - 304 p.
2. Information technologies in economics and management: textbook for academic bachelor's degree / V.V. Trofimov [etc.]; under Edited by V.V. Trofimov. — 2nd ed., revised. and additional - Moscow: Yurayt Publishing House, 2018. - 482 p.
3. Sovetov, B.Ya. Information technology: a textbook for applied bachelor's degree / B. Ya. Sovetov, V. V. Tsekhanovsky. - 7th ed., revised and additional - Moscow: Yurayt Publishing House, 2019. - 327 p.
4. Izbachkov Yu.S. Information systems: Textbook for universities / Yu.S. Izbachkov, V.N. Petrov. – 3rd ed. – St. Petersburg: Peter, 2011. – 544 p.

#### Project Management:

1. Basic terms and definitions.
2. Evolution of project management systems.
3. Project charter.
4. Project life cycle.
5. Participants and structure of the project.
6. Analysis of stakeholders in the project.
7. Project phases.
8. Project milestones.
9. Completion of the project.
10. Project cost management.
11. Risk management in the project.
12. Project change management.
13. Quality management in the project.
14. Project management standards.
15. Main roles in the IT project.
16. Project networks.
17. Project management office.
18. Multi-criteria choice of IS.
19. Project portfolio management.
20. Pattern technique.
21. Automated project management systems.
22. Cascade model of software development.

23. V-shaped software development model.
24. Incremental software development model.
25. Iterative model of software development.
26. Spiral model of software development.
27. Agile principles.
28. Lean approach.
29. Scrum methodology.
30. Features of PRINCE2.

Study Literature:

1. Ilyin I.V. and others. Project management: St. Petersburg: POLYTECH-PRESS, 2021.
2. Matveeva L., Nikitaeva A. IT project management. – Litres, 2022.
3. Kozhina A. V. Features of IT project management // Education and science without borders: social and humanitarian sciences. – 2016. – No. 4. – P. 84.

### Entrance exam assessment criteria

The test is a set of test tasks reflecting questions on the main sections of three disciplines presented in the Program of entrance examinations to the master's program in the field of "Business Informatics":

- Business Process Modeling – 40 points;
- Information Systems Life Cycle Management – 40 points;
- Project Management – 20 points.

Test tasks are completed without the use of auxiliary educational materials, in written form.

Types of test items:

According to the method of answering, test tasks can be of the following main types:

- closed tests with one correct answer, in which you need to choose only one correct answer from the proposed options;
- closed tests with two or more correct answers, in which at least two correct answers must be marked from the proposed options;
- open tests in which there are no correct answer options; the applicant must give the only correct answer independently.

Test questions will be divided into three blocks.

Block 1. Discipline "Business Process Modeling".

Number of test questions – 10, including:

- closed test tasks – 9;
- open test tasks – 1.

Block 2. Discipline "Information Systems Life Cycle Management".

Number of test questions – 10, including:

- closed test tasks – 9;
- open test tasks – 1.

Block 3. Discipline "Project Management".

Number of test questions – 10, including:

- closed test tasks – 9;
- open test tasks – 1.

Block 1. Discipline «Business Process Modeling» (40 points).

For each correctly solved closed test task with one correct answer, 4 points are assigned.

For each correctly solved closed test task with more than one correct answer, provided that all correct answers are selected, 4 points are assigned.

If in a closed test task with two or more correct answers the applicant did not mark all correct answer options, 2 points are assigned for the test task.

For each correctly solved open test task, 4 points are assigned.

Block 2. Discipline «Information Systems Life Cycle Management» (40 points).

For each correctly solved closed test task with one correct answer, 4 points are assigned.

For each correctly solved closed test task with more than one correct answer, provided that all correct answers are selected, 4 points are assigned.

If in a closed test task with two or more correct answers the applicant did not mark all correct answer options, 2 points are assigned for the test task.

For each correctly solved open test task, 4 points are assigned.

Block 3. Discipline «Project Management» (20 points).

For each correctly solved closed test task with one correct answer, 2 points are assigned.

For each correctly solved closed test task with more than one correct answer, provided that all correct answers are selected, 2 points are assigned.

If in a closed test task with two or more correct answers the applicant did not mark all correct answer options, 1 point are assigned for the test task.

For each correctly solved open test task, 2 points are assigned.

The total score is 100 points.

If in an open test, despite the solution algorithm provided by the applicant, there is no final and only correct answer, no points are awarded for the test task.

If all answer options in a test task are marked as correct, no points are awarded for the test task.

**Assigned group**

Chairman of the Subject Committee:

Head of Institute of Industrial Management, Economics and Trade, V. E. Shchepinin

Compiled by:

Head of Higher School of Business Engineering, Professor, I.V. Ilin

Professor, A.I. Levina

Associate Professor, A.S. Dubgorn

Associate Professor, S.V. Shirokova