



APPROVED:
Vice-rector for study and methodical work
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20 22.

***Интеллектуальные информационные системы / Intellectual
information systems***

Syllabus of the course

| | |
|---------------------------|---------------------------------------|
| Specialty | 38.04.02 Management |
| Specialization | International Business Administration |
| Level of higher education | Master's Degree |
| Form of training | Full-time |
| Year of enrolment | 2022 |

Authored by:

Associate Professor, PhD, Olga A. Konnikova

| | | |
|-----------------------|-----|---|
| Total number of hours | 108 | Form of final attestation: Test: semester I |
| incl: | | |
| contact work | 32 | |
| self-study | 76 | |
| practical training | 0 | |
| control hours | 0 | |

Hours distribution:

| Semester: | 1 |
|-----------------------------|------------|
| Type of classes | Hours |
| Contact hours | 18 |
| Practical training | 14 |
| Laboratory work | |
| Total contact hours | 32 |
| Self-study | 76 |
| Control hours | 0 |
| Total academic hours | 108 |
| Total credits | 3 |

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1. LEARNING OBJECTIVES

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|-------------------|--|
| Objective: | Formation of professional competencies among students, allowing them to participate in the organization and conduct of research to solve research and management tasks, including using intellectual information and analytical systems. |
|-------------------|--|

2. COURSE PLACE IN THE PROGRAMME STRUCTURE

Discipline B1.O Intellectual information systems refers to the mandatory part of Block 1.

3. EXPECTED LEARNING OUTCOMES

| Code and name of graduate competence | Code and name of the competence achievement indicator | Expected learning outcomes |
|--|--|---|
| GPC-2 – Able to apply modern techniques and methods of data collection, advanced methods of their processing and analysis, including the use of intellectual information and analytical systems, in solving managerial and research problems | GPC-2.1 – Effectively uses modern techniques and methods of data collection, advanced methods of their processing and analysis, as well as intellectual information and analytical systems in solving management and research problems | <p>To know: the possibilities of intellectual information-analytical systems for solving managerial and research problems.</p> <p>To be able to: apply modern techniques and methods of data collection; choose advanced methods for their processing and analysis; perform analytical actions using quantitative and qualitative information; apply methods of computer processing of research results in solving managerial and research problems.</p> <p>To master: basic and advanced methods, techniques, algorithms, models of socio-economic research.</p> |
| GPC-4 – Able to manage project and process activities in the organization using modern management practices, leadership and communication skills, identify and evaluate new market opportunities, develop strategies for creating innovative activities and corresponding business models of organizations | GPC-4.3 – Develops innovative business models through modern digital technologies, using modern management practices, leadership and communication skills | <p>To know: important issues of presentation of research results; methods and techniques for processing the results of the research, including the use of modern digital technologies.</p> <p>To be able to: identify and evaluate new market opportunities; manage project and process activities in the organization using modern management practices, leadership and communication skills.</p> <p>To master: skills to develop a strategy for the creation and development of innovative activities and their corresponding business models of organizations through modern digital technologies.</p> |

4. COURSE STRUCTURE AND CONTENT

| Code and name of the topics | Course content | Academic hours | | | |
|---|--|----------------|-----------|-----------|------------|
| | | Contact work | | | Self-study |
| | | Lectures | Practices | Workshops | |
| Topic 1. The concept of intellectual information systems for solving managerial and research problems. | Information support of the company's activities. The main components of intellectual information systems. Tasks solved with the help of intellectual information systems. Big data and data mining as sources of information for building intellectual information systems. The concept of CRM and ERP systems. | 2 | 2 | | 12 |
| Topic 2. Research methodology and research design. | Typical market research formats. The main problems in conducting market research. Scheme of the market research process. Types of data and main sources of information for conducting an analysis of the company's market environment. Basic research methods: empirical, expert, economic and mathematical. Research methodology and research design. Basic definitions: research question, hypothesis, sample. Classification of marketing research. The difference between the methodology of quantitative research and the methodology of qualitative research. Typical goals of quantitative empirical research. Interrelation of a practice-oriented problem and setting tasks that contribute to its effective solution. Stages of quantitative research methodology. Conceptual research model. Statement of hypotheses, identification of dependent and independent variables, selection of scales for their evaluation. Problems of measuring variables in quantitative research. Reliability, validity of the measurement. Latent variables. Research limitations. Development of a questionnaire for quantitative research. Features of the formation of a sample of a quantitative empirical study. | 4 | 2 | | 16 |
| Topic 3. Primary processing of research results: data preparation, graphical description of data, descriptive statistics. | Classification of methods of statistical data analysis. Basic types of quantitative data. Basic concepts of quantitative data analysis. The concept of statistical hypothesis. Null and alternative hypotheses. Type I and Type II error. Significance level of the statistical test. Processing of primary data. Data cleaning and outlier identification. Description of the data. Primary data analysis: Graphical representation of data. Descriptive statistics. Selection of descriptive statistics depending on the type of variable. Normal distribution. | 2 | 2 | | 12 |
| Topic 4. Basic methods of data analysis: contingency tables, correlation and regression analysis, analysis of variance. | Examples of marketing tasks solved using the method of constructing contingency tables. Chi-square test and its significance. Features of constructing contingency tables in various software. Connection types. Correlation analysis: correlation coefficients. Significance of the correlation. Correlation matrix. Private correlations. The procedure for conducting correlation analysis. Regression analysis in marketing | 4 | 4 | | 12 |

| | | | | | |
|---|--|-----------|-----------|----------|-----------|
| | research. Linear regression. Paired and multiple regression analysis. Significant criteria: coefficient of determination, significance level of the regression model, standardized and non-standardized regression coefficients. Regression equation. The procedure for conducting regression analysis. Problems in the construction of regression models. Forecasting as the main task of correlation-regression data analysis. The concept of dispersion. Types of dispersion analysis. One-way analysis of variance. Examples of problems solved using dispersion analysis. Fisher's F-test. Criterion for homogeneity of dispersions. Algorithm for carrying out dispersion analysis. Multivariate analysis of variance: features of the formulation of hypotheses, methodology, interpretation of results. | | | | |
| Topic 5. Advanced methods of data analysis: time series analysis, discriminant analysis, factor analysis, cluster analysis. | Problems solved by using discriminant analysis. Algorithm for conducting discriminant analysis. Criterion Lambda Wilks and evaluation of the quality of the model. Compiling a classifying function and checking its quality. Use restrictions. Prediction using discriminant analysis. The role of factor analysis in marketing research. Factor analysis procedure: main stages. Extraction of factors. Rotation of factors. Interpretation of factors. Principal component method. Relationship between factor analysis and correlation analysis. The role of cluster analysis in marketing research. Cluster analysis procedure: main stages. Standardization of variables. Construction of dendrograms and their interpretation. Relationship between cluster analysis and factor analysis. Time series analysis. | 4 | 4 | | 12 |
| Topic 6. Conducting research in the digital environment | Features of market research, consumers and competitors in the digital environment. Market and competitor analysis services. Analysis of potential demand and needs of the target audience. Media statistics services. Analysis of the company's web resources (website, social networks). Parsing information in the digital environment. Web analytics. | 2 | | | 12 |
| Control hours: | | | | | 0 |
| Total hours: | | 18 | 14 | 0 | 76 |

5. TEACHING AND LEARNING TOOLS OF THE COURSE

5.1 Recommended literature

| Bibliographic description of the publication (author, title, type, place and year of publication, number of pages) | Digital resources |
|--|---|
| Stankevich, Lev A. Intellectual systems and technologies: Textbook and workshop for universities / Stankevich L. A. Moscow: Yurayt, 2021. 397 pp. (Higher education) | https://urait.ru/bcode/469517 |
| Kudryavtsev, Valery B. Intellectual systems: Textbook and workshop for universities / Kudryavtsev V. B., Gasanov E. E., | https://urait.ru/bcode/423761 |

| | |
|---|---|
| Podkolzin A. S. 2nd ed., corrected and added. Moscow: Yurayt, 2019. 165 pp. (Higher education) | |
| Trushnikova, Irina O. Quantitative methods of research in marketing: study guide / Trushnikova I.O., Shirshova O.I., Pogrebova O.A.; Ministry of Education and Science Ros. Federation, St. Petersburg State. University of Economics, Department of Marketing, 2017. | http://opac.unecon.ru/elibrary ... 20исследований.pdf |
| Skorobogatykh I.I., ed., Efimov D.M., ed. Marketing research and situational analysis. Moscow: KnoRus, 2019. 568 pp. | https://book.ru/book/930727 |
| Business Analytics: textbook / I.L. Andreevsky, H.I. Aminov. - St. Petersburg: St. Petersburg State University of Economics, 2019. 73 pp. | http://opac.unecon.ru/elibrary ... ·Ð½Ð¼Ñ-Ð°Ð½Ð°Ð»Ð¸Ð·Ð¸Ð½Ð°.pdf |

5.2 List of software (including national production)

- 7-Zip
- Microsoft Office Professional
- Microsoft Windows Professional
- IBM SPSS
- Loginom
- PEPPER.NINJA

5.3 List of reference systems and modern professional databases

| № | Name of reference systems and professional databases |
|-----|---|
| 1. | Digital library Grebennikon.ru – www.grebennikon.ru |
| 2. | Science Digital Library eLIBRARY – www.elibrary.ru |
| 3. | Science Digital Library КиберЛеника – www.cyberleninka.ru |
| 4. | Database ПОЛПРЕД Справочники – www.polpred.com |
| 5. | Database OECD Books, Papers & Statistics on the platform OECD iLibrary www.oecd-ilibrary.org |
| 6. | Legal reference system КонсультантПлюс (installed resource UNECON or www.consultant.ru) |
| 7. | Legal reference system «ГАРАНТ» (installed resource UNECON or www.garant.ru) |
| 8. | Information and referral system «Кодекс» (installed resource UNECON or www.kodeks.ru) |
| 9. | Digital library system BOOK.ru - www.book.ru |
| 10. | Digital library system ЭБС ЮРАЙТ – www.urait.ru |
| 11. | Digital library system ЗНАНИУМ (ZNANIUM) – www.znanium.com |
| 12. | Digital library UNECON – opac.unecon.ru |

6. TECHNICAL FACILITIES

There are special rooms for lectures, seminars, coursework, group and individual consultations, current and interim assessments, as well as rooms for self-study.

The premises are equipped with equipment and teaching aids.

The rooms for students' independent work are equipped with computers with Internet connection and access to the university's electronic learning environment.

| Name of classroom | Classroom location |
|---|---|
| Classroom 1043 Training classroom (for lecture- and seminar-type classes, coursework, group and individual consultations, current control and intermediate attestation), equipped with a multimedia system. Specialised furniture and equipment: Educational furniture for 42 seats (21 desks), teacher's workplace, chalk board 1 pc. (3 sections), chair 1 pc., table 2 pcs., iso chair 2 pcs.. Portable multimedia kit: Laptop HP 250 G6 1WY58EA, Multimedia projector LG PF1500G. Sets of display equipment and visual aids: multimedia applications for lecture courses and practical sessions, interactive teaching and visual aids. | 191023, St. Petersburg, Griboedova canal, 30-32, lit. A, B, P |
| Classroom 1064 Training classroom (for lecture- and seminar-type classes, coursework, group and individual consultations, current control and intermediate attestation), equipped with a multimedia system. Special furniture and equipment: Educational furniture for 42 seats, a teacher's workplace, a whiteboard - 1 pc, a table - 1 pc, a chair - 1 pc, an interactive projector Epson-EB-455Wi - 1 pc, a computer Intel i3-2100 2.4 Ghz/4Gb/500Gb/Acer V193 19" - 1 pc. Sets of display equipment and visual aids: multimedia applications for lecture courses and practical sessions, interactive teaching and visual aids. | 191023, St. Petersburg, Griboedova canal, 30-32, lit. A, B, P |
| Classroom 2007 Training classroom (for lecture- and seminar-type classes, coursework, group and individual consultations, current control and intermediate attestation), equipped with a multimedia system. Specialized furniture and equipment: Training furniture for 126 seats, teacher's workplace, m/m table - 1 pc, desk - 6 pcs, chair - 1 pc, chalk board (3 sectional) - 2 pcs, Chair - 3 pcs., Computer Intel i3-2100 2.4 Ghz/4Gb/500Gb/Acer V193 19" - 1 pc, Multimedia projector Type 2 Panasonic PT-VX610E - 1 pc, ScreenMedia Champion 244x183cm (SCM-4304) - 1 pc. Sets of display equipment and visual aids: multimedia applications for lecture courses and practical sessions, interactive teaching and visual aids. | 191023, St. Petersburg, Griboedova canal, 30-32, lit. A, B, P |
| Classroom 2009 Training classroom (for lecture- and seminar-type classes, coursework, group and individual consultations, current control and intermediate attestation), equipped with a multimedia system. Special furniture and equipment: Educational furniture for 122 seats (study table 61 pcs., chairs 122 pcs.), the teacher's workplace, desk m/m, drawer 1 pc, chalk board 1 pc (3 sections), chair 1 pc, drawer 1 pc, chair 1 pc, Chair 2 pcs., Intel i3-2100 2.4 Ghz /4Gb/500Gb/Acer V193 19" - 1 pc, Sound projector Yamaha YSP-3000 - 1 pc, Projector stand with camera decks - 1 pc, Projection screen draper - 1 pc, Multimedia projector Type 2 Panasonic PT-VX610E - 1 pc, Screen Media D1 ceiling bracket - 1 pc. Sets of display equipment and visual aids: multimedia applications for lecture courses and practical sessions, interactive teaching and visual aids. | 191023, St. Petersburg, Griboedova canal, 30-32, lit. A, B, P |

7. METHODOLOGICAL GUIDELINES FOR STUDENTS

The following documents should be made available to the trainee before the start of the course:

- training and methodological documentation;

- local normative acts regulating the main issues of the organisation and implementation of educational activities, including those regulating the procedure for current monitoring and interim assessment of students;
- the schedule of consultations of the teaching staff.

The level and depth of mastering the discipline is determined by the active and systematic work of students in lectures, seminars, independent work, including in terms of identifying the most significant and relevant problems for further study. A special condition for qualitative mastering of the discipline is an effective organisation of work, which allows distributing the academic workload evenly in accordance with the schedule of the educational process.

When preparing for classes, students have the opportunity to attend consultations with the staff of UNECON according to the timetable set out in the schedule of consultations.

The students' in- and out-of-classroom work should aim to form:

- the fundamentals of the learner's world view and scientific understanding;
- basic knowledge relevant to the training area and the declared professional field, forming the target and professional basis for training;
- professional competences oriented towards the needs of the labour market;
- an individual trajectory by mastering a unique set of professional competences that complement the learner's competence model, through a focus on specific professional specialised areas of knowledge defined by labour market representatives;
- meta-skills for learners, such as teamwork and leadership, data analysis, digital skills, project design and implementation, intercultural interaction.

8. SPECIFICATIONS FOR TEACHING DISABLED PERSONS

Students with disabilities, if necessary, are taught on the basis of an adapted work programme using special teaching methods and didactic materials that take into account the particularities of their psychophysical development, individual capacities and health status.

In order for disabled persons and persons with disabilities to master the curriculum, the University shall ensure that:

- for the visually impaired and visually impaired: availability of information on the timetable in accessible places and adapted forms for learners who are blind or visually impaired; presence of an assistant to assist the learner as needed; production of alternative formats of teaching materials (large print or audio files);
- for the hearing-impaired and hearing-impaired: adequate sound reproduction of information;

– for persons with disabilities and persons with mobility impairments: the possibility of unimpeded access for students to classrooms, restrooms and other areas of the department, as well as their stay in these areas.

Learners with disabilities and persons with disabilities are provided with printed and/or electronic educational resources in forms adapted to their disabilities. The education of students with disabilities may be organised with other students or in separate groups or organisations.

ASSESSMENT RESOURCES

1.1 Control tasks and assignments for interim attestation

Is not provided by the work programme of the discipline.

1.2 Topics for written task

Is not provided by the work programme of the discipline.

1.3 Interim checkpoints

| Number | Type | Method of conduct | Topic number |
|---------------|---------------------------------|--|---------------------|
| 1 | Design and analytical work | with the help of technical means and information systems | 1-3 |
| 2 | Information and analytical work | with the help of technical means and information systems | 4-6 |
| 3 | Monitoring | with the help of technical means and information systems | 1-6 |

1.4 Other assessment objects

Is not provided by the work programme of the discipline.

1.5 Self-study

| Name of self-study | Topic number |
|---|---------------------|
| Preparation for lectures and seminars | 1-6 |
| Working with analytical databases, regulatory documents, reference literature | 2,6 |
| Solving professional problems | 3-6 |
| Performance of calculation, analytical, settlement-graphic and other tasks | 3-5 |

1.6 Grading scale

Scales of assessment and procedures for assessing learning outcomes of the discipline are regulated by the Regulations on the current control of progress and interim attestation of students in higher education programmes and the Regulations on the scoring and rating system.

A grading and rating system is used to assess the learning outcomes of the discipline:

The final control of the discipline is an examination (or a differentiated test), the final grade being formed in accordance with the scale given in the table below:

| Points | Grade |
|-----------|-------|
| ≤ 54 | fail |
| > 55 | pass |

Grading scale

| | |
|-------------------|---|
| 2 (points to 54) | Demonstrates a lack of understanding of the problem. Many of the requirements of the assignment are not met. An initial perception of the material is demonstrated. The work is incomplete and/or plagiarized. |
| 3 (points 55-69) | Demonstrates a partial understanding of the problem. Most of the requirements of the task have been met. Mastery of the elements of the assigned material. The material is mostly clear and coherent. |
| 4 (points 70-84) | Demonstrates considerable understanding of the issue by the discipline. All requirements of the assignment are fulfilled. The content of the completed tasks is disclosed and examined from different perspectives. |
| 5 (points 85-100) | Demonstrates full understanding of the problem. All requirements of the assignment are fulfilled. Demonstrates proficiency in the discipline. The completed assignments are holistic, complete, structured, present different points of view and demonstrate creativity. |