

Ministry of Science and Higher Education of the Russian Federation
NATIONAL RESEARCH
TOMSK STATE UNIVERSITY (NR TSU)

Institute of Applied Mathematics and Computer Science



A. V. Zamyatin

Work program of the discipline

Social Media Analytics

in the major of training

01.04.02 Applied mathematics and informatics

Orientation (profile) of training:

Big Data and Data Science

Form of study
full-time

Qualification
Master

Year of admission
2024

Code of discipline in the curriculum: B1.R.V.DV.02.01

AGREED:
Head of EP

A.V. Zamyatin

Chairman of the EMC

S.P. Sushchenko

Tomsk – 2024

1. Purpose and planned results of mastering the discipline

The purpose of mastering the discipline is the formation of the following competencies:
– PC-4 – the ability to define a problem situation, set tasks for data analysis in the social sciences, select mathematical and hardware tools to solve them.

The results of mastering the discipline are the following indicators of the achievement of competencies:

IPK-4.1. Gives an assessment of the behavior of society or its individual groups based on data analysis.

IPK-4.2 Collects information from the Internet, incl. from social networks and processes it.

IPC-4.3 Analyzes the received information and finds hidden patterns.

2. Tasks of mastering the discipline

– Assimilation by students of specific knowledge in the field of methodology and methods, for the development of sociological imagination, without which there is no modern analyst of big data of social media.

3. The place of discipline in the structure of the educational program

The discipline refers to the part of the educational program formed by the participants in educational relations, Elective disciplines 2.

4. Semester of mastering and form of intermediate certification in the discipline

Third semester, exam.

5. Entrance requirements for mastering the discipline

For the successful mastering of the discipline, training outcomes are required in the following disciplines: "Information security and work with personal data".

6. Implementation language

English.

7. Scope of discipline

The total labor intensity of the discipline is 3 credits, 108 hours, of which:

- lectures: 10 hours

- laboratory: 20 hours

including practical training: 0 h.

The volume of independent work of the student is determined by the curriculum.

8. The content of the discipline, structured by topics

Topic 1. Introductory lecture

What is science? The concept of scientific research. An elementary act of research activity. Framework principles of scientific research. Functions of scientific research.

Topic 2. Development of the problem and research hypothesis

Description of the problem situation. The problem as a cognitive obstacle. Empirical and conceptual subject problems. Methodological and evaluative procedural problems. Correctness and solvability of the problem. Methodological part of the research program: formulation of the problem, goal, objectives, object and subject of research. Preliminary data on the object of study. Interpretation of concepts. Research hypotheses. The role of hypotheses in scientific research. System analysis and its importance in the construction of hypotheses. Requirements for hypotheses. Types of hypotheses: primary, descriptive, explanatory. Hypotheses-consequences. Hypothesis testing. Organizational and technical plan of the study, its goals. The choice of

methods for collecting and analyzing information. The specifics of the design of a qualitative study.

Topic 3. Methodology of social research

Concepts of methodology, its levels and varieties. Methodology functions: orienting, systematizing, explanatory. Methodological correctness: explicitness, systematicity, reproducibility, the presence of hypotheses. Methodology of theoretical research, empirical and applied. Correlation of the concepts "methodology", "method", "technique", "technique". The concept of the quality of sociological research: the quality of the purpose of the study, the means, the process and the result of the study. Characteristics of the research result: reliability and significance.

The quality of primary sociological information, The concept of reliability and its levels: theoretical, methodological and organizational. The main indicators of reliability: correctness, stability, validity.

Topic 4. Features of the quantitative and qualitative strategy of social research

Qualitative and quantitative strategies. Discussion about qualitative and quantitative methods: its stages and main conclusions. Specificity of qualitative and quantitative approaches. Theoretical and methodological base; focus of analysis; research goals and objectives; analysis logic; presentation style; reliability criteria.

Topic 5. Classification of social research methods

Classification of methods of social research: methods of collecting information, methods of processing and analysis. The main methods of data recording: polling method, documentary method, observation method, their features. Methods for selecting units of observation: continuous and selective. Analysis methods: general scientific. Mathematical: factor analysis, correlation analysis.

Topic 6. Program (design) of social research

Purpose and tasks of the program of sociological research. The content of the social program research. particular social situation. The concept of scientific and practical problems. Purpose and objectives of the study. Object of study. Units of observation. Subject of study.

Topic 7. Sampling method in social research

The essence of the sampling method, the concept of sampling. General and sample populations. Units of selection, units of observation. Types of samples (methods of forming a sample population). Random selection and its basic principles and methods (lottery, systematic). The concept of sampling frame. Modified sampling, basic methods (territorial sampling, nesting, stratified).

Targeted selection (non-random sampling), its principle and main methods (quota sampling, spontaneous, route, main array).

Sample size, main factors determining it. The concept of representativeness, errors of representativeness: systematic and random, intentional and unintentional. Methods for determining representativeness errors: indirect, factual, theoretical. Sample specifics in a qualitative study: types and volume.

Topic 8. Analysis of social research data

The concept and purpose of data analysis. The concept and types of sociological data. Main stages of sociological research data analysis. Processing of sociological information. Primary and secondary data processing. Coding (continuous, positional). Check for accuracy and completeness of filling. Theoretical and empirical typology. Building models. The role of analysis in sociological research: qualitative.

Topic 9. Methodology and methods of natural language analysis

The concept and principles of natural language analysis. Possibilities of natural language analysis in social research. Methods and techniques of automatic text analysis.

Topic 10. Network analysis in social research

Some principles of network analysis: the study of relationships, not attributes; focus on networks rather than groups; analysis of relationships in the context of all relationships.

Typology of connections. Typology of networks: networks and ego networks; bimodal networks. Study design using a network approach. The problem of sampling and drawing network boundaries. Approaches to drawing boundaries: positions, relationships, events. Matrix and graphical way of presenting data. Relationship types (binary-valued, directed-undirected). Network types. Sample and data sources.

Node routing properties: reciprocity, transitivity. properties of centrality. Centrality: degree. The difference between indegree and outdegree. Centrality: betweenness centrality. Centrality: closeness centrality.

Two types of approaches to groups The concept of sub-structure. From "micro" to "macro" (bottom-up). Cliques, clans, K-plexes, cores. From "macro" to "micro" (top to bottom). Components, Fractions, Bridges, Cutpoints.

9. Ongoing evaluation

The main forms and stages of assessing the current progress in the study of the discipline is project work. The project work solves the problem of developing competencies to form the ability to independently formulate goals, set specific tasks for scientific research in various fields of sociology and solve them using modern research methods using the latest domestic and foreign experience and using equipment and information technologies.

Requirements for writing a research project

During the course of the research project, the student must submit:

- analysis of literature on the chosen topic;
- research program;
- justify the choice of method and develop data collection tools;
- sample design;
- to carry out the field stage of the study;
- process, describe and interpret the received data;
- present the results in the form of a report.

Approximate topic of the research project

- 1.Features of the life style of student youth
- 2.Expectations of young professionals in employment
3. Reasons for the decline in student performance
- 4.Religiosity of the youth of Tomsk
5. The unemployed of Tomsk and the possibility of their adaptation
- 6.Motives for choosing a profession for students
7. Demonstrative consumption of student youth
8. Forms of civic engagement of students
- 9.Leisure of youth
- 10.Secondary employment of students
11. Gender stereotypes as a factor of gender asymmetry
- 12.Motivation of members of online communities
- 13.Policy and activities of private sports institutions
14. Conditions for the development of educational achievements of secondary school students
15. Value orientations of participants in political organizations

10. The procedure for conducting and criteria for evaluating the intermediate certification

During the exam, the teacher draws up exam tickets, which include two theoretical questions and a practical task (the student performs on a computer). The wording of the questions coincides with the wording of the list of examination questions brought to the attention of students on the eve of their delivery. The content of the questions of one ticket relates to

various topics of the program in order to more fully cover the material of the academic discipline.

Questions for exam tickets:

1. The concept and characteristics of the methodology of scientific research, the features of the use of specific methodological principles in sociological research.
 2. Methodological substantiation of the choice of the type of research in sociology, criteria and classifications, detailed characteristics of the types of sociological research.
 3. Cognitive possibilities of quantitative and qualitative research in sociology, their types, strategy and tactics of organization and conduct.
 4. The program of sociological research, the main requirements for its development and the functions performed.
 5. Sections of the program of sociological research: characteristics and requirements, main shortcomings in the development and implementation.
 6. Methodological section of the sociological research program: structure, development requirements, main mistakes.
 7. General and sample populations in a sociological study.
 8. Sampling: types and methods of development, strategies for calculating its volume, errors and ways to overcome them in sociological research.
 9. Functions of a question in sociological research, basic approaches to classification, principles and rules of formulation.
 10. Characteristics of the types of questions in a sociological study, the main mistakes in constructing a questionnaire.
 11. Poll in a sociological study: quality criteria, classification of species, technical means of conducting.
 12. Questionnaire survey in a sociological study: characteristics, scope, requirements for the organization, procedure for conducting, advantages, disadvantages and difficulties.
 13. Sociological interview: characteristics, scope, requirements for the organization, procedure for conducting, advantages, disadvantages and difficulties.
 14. Expert survey: characteristics, scope, requirements for the organization, procedure, advantages, disadvantages and difficulties.
 15. Focus group in sociology: characteristics, scope, requirements for organization, procedure, advantages, disadvantages and difficulties.
 16. Observation in a sociological study: characteristics, scope, requirements for organization, procedure for conducting, advantages, disadvantages and difficulties.
 17. Measurement in sociology, its methods, procedures and main criteria.
 18. Analysis of documents in sociology, the specifics of the application of traditional and formalized methods, the specifics of the application of the content analysis method in sociological research.
 19. Projection methods in sociology, areas of their application, basic procedures, advantages and disadvantages of use in sociological research.
- Ways of presenting the results of sociological research: basic requirements, rules and shortcomings.

11. Educational and methodological support

- a) Electronic training course on the discipline at the electronic university "Moodle"
- b) Assessment materials of the ongoing evaluation and intermediate certification in the discipline.

12. List of educational literature and Internet resources

- a) main literature:

- M.K. Gorshkov, F.E. Sheregi. Applied sociology: methodology and methods. – Institute of Sociology RAS, 2014.
- Workbook of a sociologist. – Librocom, 2015.
- Batygin G.S. Lectures on the methodology of sociological research: textbook. for students humanit. universities and graduate students. - RUDN University, 2008.
- Grushin B. A. Opinions about the world and the world of opinions. – Praxis, 2011.
- Devyatko I.F. Methods of sociological research. - Publishing house of KDU, 2009.
- Ilyin V.I. Dramaturgy of qualitative field research. – Intersocis, 2006.
- Quale S. Research interview. – Meaning, 2009.
- Kovalev E.M., I.E. Steinberg. Qualitative methods in field sociological research. – Logos, 1999.
- Prakazina NV Sociological culture: on the content and interpretation of the concept. - SOCIS, 2011.
- Yadov V. A. Strategy of sociological research. Description, explanation, understanding of social reality. – Omega-L, Gr. Companies, 2009.

13. List of information technologies

a) licensed and freely distributed software:

- Microsoft Windows 7 software package, IBM SPSS Statistics 22

b) information reference systems:

- Library Gumer <http://www.gumer.info/>
- Library thinking about Russia <http://www.patriotica.ru/history/index.html>
- Library of the Internet portal “Economics. Sociology. Management” <http://ecsocman.hse.ru>
- Library <http://www.book.ru/>

14. Logistics

- Availability of a computer class;
- Availability of access to the Internet available to the student;
- Availability of equipment for classrooms and auditoriums for multimedia presentations.

15. Authors information

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