



KAZAKH NATIONAL WOMEN'S TEACHER TRAINING UNIVERSITY
DEPARTMENT OF NATURAL SCIENCES
7M01506-Geography
Catalog of elective disciplines

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1 OPTIONAL COMPONENT OF THE CYCLE OF CORE COURSES

Component of choice 1

Course: Planning and organization of scientific research

Intensity of the Course: 5 academic credits

Module Code: MGS 51506/1

Module Name: Methodology of Geographical Science and Innovative Technologies in Education

Prerequisites: EGP 404/2 Applied Geography

Purpose: The aim of the course is to provide master's students' theoretical knowledge and practical skills in planning, organizing and conducting scientific research, as well as competencies in managing research projects, analyzing and evaluating research outcomes, and presenting scientific results in academic and professional environments.

Short Description: The discipline is aimed at training master's students with competencies in the field of scientific research. Within the course, master's students study the main stages of scientific research – from topic selection and hypothesis development to the analysis and application of research results. They also become acquainted with the specifics of managing research teams, distributing responsibilities, and collaborating with colleagues and scientific institutions. Particular attention is paid to issues of scientific ethics, legal aspects of research, and standards for handling scientific information. In addition, the discipline develops skills in data analysis, evaluation of scientific results, and presentation of findings in the form of scientific publications and reports.

Learning Outcomes in EP (LOP):

LO 1 – Integrates scientific results into educational content, taking into account the interconnection between science and the educational process, current issues in the history and philosophy of science, the professional foundations of speech communication, and the observance of ethical and legal standards in the use of artificial intelligence under conditions of educational transformation.

LO 3 – Presents the structure, methodology, data, and conclusions of the research in accordance with academic standards, while observing ethical norms at all stages of the scientific process.

Learning Outcomes in Course/ Discipline (LOD):

LOD 1 – Critically analyze the conceptual and methodological foundations of scientific research and independently develop research problems, objectives, hypotheses, and research designs.

LOD 2 – Apply contemporary approaches to planning and organizing scientific research, effectively managing research projects, research teams, and scientific information processes.

LOD 3 – Collect, process, and analyze research data in accordance with research ethics, academic integrity, and legal requirements, and evaluate the scientific validity and practical significance of research findings.

LOD 4 – Prepare and effectively communicate research outcomes through scientific articles, reports, presentations, and other scholarly outputs in accordance with international academic standards.

Post requisites: ISE 54506 Cartographic support of scientific research

Component of choice 1

Course: Theoretical and methodological problems of geography

Intensity of the Course: 5 academic credits

Module Code: MGS 51506/2



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Module Name: Methodology of Geographical Science and Innovative Technologies in Education

Prerequisites: TMP 301 Methods of teaching geography

Purpose: The aim of the course is to provide master's students with an understanding of the theoretical and methodological foundations of geographical science, develop critical comprehension of scientific paradigms and spatial analysis, form skills in applying modern methods to study natural and socio-economic processes, and enhance competencies in designing and scientifically justifying research projects.

Short Description: The course covers the theoretical and methodological foundations of geographical science, concepts of spatial analysis, scientific paradigms, and modern research methods. Master's students study the structure of geographical knowledge and the methodology of integrated analysis of natural and socio-economic processes. Skills in critical thinking, data analysis, interpretation, and evidence-based reasoning are developed. The course fosters the ability to apply theoretical knowledge in practical and research tasks, to systematize and substantiate scientific results. In addition, methodological competencies aimed at developing innovative geographical projects are enhanced.

Learning Outcomes in EP (LOP):

LOP 4 – Constructs a scientific-analytical model explaining the interrelationships between natural and socio-geographical systems and defines a research concept based on the integration of theoretical and methodological foundations of geographical science and paradigms of spatial research.

Learning Outcomes in Course/Discipline (LOD):

LOD 1 – Critically analyzes the main theoretical paradigms, concepts, and methodological approaches in geographical science and explains their development logic.

LOD 2 – Applies principles of spatial analysis and geographical research methods to comprehensively study natural and socio-economic processes.

LOD 3 – Interprets, systematizes, and scientifically justifies geographical data, formulating well-grounded research conclusions.

LOD 4 – Develops innovative research projects based on geographical theories and methodologies and presents scientific results in accordance with academic standards.

Post requisites: MGS 61506/1 Geographical modeling

Component of choice 2

Course: **Geographical modeling**

Intensity of the Course: 5 academic credits

Module Code: MGS 61506/1

Module Name: Methodology of Geographical Science and Innovative Technologies in Education

Prerequisites: MGS 51506/1 Planning and organization of scientific research

Purpose: The aim of the course is to develop master's students' skills in building and applying models of spatial and territorial processes, as well as to enhance competencies in analyzing, forecasting, and scientifically justifying natural and socio-economic phenomena using geographic information systems and digital methods.

Short Description: The discipline aims to develop theoretical and practical knowledge among master's students in constructing and applying models that describe spatial and territorial processes. Students master the main methods and approaches of geographical modelling and enhance their skills in applying numerical, analytical, and mathematical tools to study and forecast natural and socio-economic phenomena. Geographic Information Systems (GIS), spatial databases, and modern software tools are used to analyze issues in ecology, urban studies,



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transport, and land use. In addition, skills in interpreting modelling results, providing scientific justification, and applying them in decision-making processes are further developed.

Learning Outcomes in EP (LOP):

LOP 4 – Constructs a scientific-analytical model explaining the interrelationships between natural and socio-geographical systems and defines a research concept based on the integration of theoretical and methodological foundations of geographical science and paradigms of spatial research.

LOP 10 – Builds predictive models, performs scenario analysis, and prepares analytical reports assessing the dynamics of natural and socio-economic processes based on the integration of applied geostatistics and spatial modeling methods.

Learning Outcomes in Course/Discipline (LOD):

LOD 1 – Explains the theoretical foundations of geographical modeling and critically analyzes and develops models of spatial and territorial processes.

LOD 2 – Applies mathematical, statistical, and numerical methods to study and forecast natural and socio-economic systems.

LOD 3 – Uses geographic information systems (GIS), spatial databases, and software tools for modeling and analyzing geographical data.

LOD 4 – Interprets modeling results, evaluates their scientific validity, and applies them to decision-making in ecology, urban studies, transport, and land use management.

Post requisites: ORW 72 Methods of Scientific Research

Component of choice 2

Course: Geoecological marketing

Intensity of the Course: 5 academic credits

Module Code: MGS 61506/2

Module Name: Methodology of Geographical Science and Innovative Technologies in Education

Prerequisites: MGS 51506/1 Planning and organization of scientific research

Purpose: Development of master's students' skills in assessing the ecological potential of territories, rational use of natural resources, and environmental risk management, as well as competencies in making ecologic-economic and marketing decisions using geographic information systems and spatial analysis.

Short Description: The discipline focuses on mastering the theoretical and applied foundations of geoecological marketing. The course examines approaches to assessing the ecological potential of territories considering geoecological factors, the efficient use of natural resources, and environmental risk management. Master's students acquire skills in analyzing geoecological information, conducting marketing-based assessments of environmental conditions, and determining the investment attractiveness of territories. Geographic Information Systems (GIS), spatial data, and modern analytical tools are used for environmental, economic, and marketing decision-making. In addition, approaches to interpreting ecological information and applying it in strategic planning and territorial management processes are examined.

Learning Outcomes in EP (LOP):

LOP 7 – Interprets structural changes in geographical-economic space and territorial development patterns through systemic analysis and compiles a set of evidence-based strategic solutions for regional planning and governance.

LOP 8 – Analyzes the spatial organization of geoecological systems and anthropogenic impacts, constructs an ecological risk assessment model, and proposes sustainable development policy recommendations.

Learning Outcomes in Course/Discipline (LOD):



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LOD 1 – Analyzes the theoretical foundations of geoecological marketing and evaluates the ecological-economic development of territories.

LOD 2 – Applies methods of collecting, processing, and analyzing geoecological data to assess the ecological potential of territories.

LOD 3 – Develops models for the rational use of natural resources and environmental risk management using geographic information systems and spatial analysis.

LOD 4 – Interprets the results of marketing and eco-economic analysis and provides evidence-based decisions in territorial development, investment attractiveness, and environmental planning.

Post requisites: IS 71506/1 Modern paradigm of geographical education

Component of choice 3

Course: Innovative methods in geographical education

Intensity of the Course: 5 academic credits

Module Code: MGS 62506/1

Module Name: Methodology of Geographical Science and Innovative Technologies in Education

Prerequisites: MGS 51506/2 Theoretical and methodological problems of geography

Purpose: Development of skills in using digital educational resources, geographic information systems, and interactive platforms, as well as enhancement of competencies in designing learning processes aimed at developing students' critical thinking, research skills, and spatial analysis abilities.

Short Description: The discipline examines innovative pedagogical technologies and modern educational approaches in teaching geography. The course covers digital educational resources, Geographic Information Systems (GIS), online maps, virtual excursions, interactive platforms, gamification, and project-based learning technologies. Master's students acquire skills in the effective use of information and communication technologies and digital cartographic tools in the educational process. Particular attention is paid to innovative teaching strategies aimed at developing students' critical thinking, research skills, and spatial analysis abilities. During the course, master's students develop skills in designing, developing, and applying innovative learning modules designed for different levels of education.

Learning Outcomes in EP (LOP):

LOP 2 – Applies the theoretical and methodological foundations of the development of pedagogical and psychological sciences, teaching methods based on inclusive principles considering master's with diverse abilities, processes of management and acquisition, and the essence and content of psychological and pedagogical research in professional practice.

LOP 5 – Designs a digital learning module, an instructional package, and an assessment system based on the principles of digital transformation and pedagogical design in geographical education.

Learning Outcomes in Course/Discipline (LOD):

LOD 1 – Critically and comprehensively analyzes the impact of innovative methods on educational content, student learning activity, and the quality of education.

LOD 2 – Evaluates the effectiveness of pedagogical technologies used in geography lessons based on defined criteria.

LOD 3 – Develops authorial lesson models, projects, or instructional modules using innovative methods and ICT in geography education.

LOD 4 – Develops innovative and original teaching methodologies or digital educational products (web resources, interactive maps, mobile applications, etc.) for use in the educational process.



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LOD 5 – Conducts research in the methodology of geography teaching, develops innovative pedagogical practices, and presents them in professional settings (seminars, conferences, scientific publications).

Post requisites: IS 71506/1 Modern paradigm of geographical education

Component of choice 3

Course: New concepts for the development of geographical education

Intensity of the Course: 5 academic credits

Module Code: MGS 62506/2

Module Name: Methodology of Geographical Science and Innovative Technologies in Education

Prerequisites: MGS 51506/2 Theoretical and methodological problems of geography

Purpose: Formation of master's students' knowledge of the theoretical and methodological foundations of modern geography education and its key development concepts, enhancement of skills in applying competency-based pedagogical models, digital technologies, and geographic information systems, as well as development of competencies in designing and implementing innovative geography education programs under global challenges.

Short Description: The discipline focuses on mastering the theoretical and methodological foundations of modern geographical education and the key concepts of its development. The course examines competency-based pedagogical models, digital technologies, Geographic Information Systems (GIS), as well as interdisciplinary and practice-oriented teaching methods. Master's students study approaches to updating the content of geographical education, designing the learning process, and effectively using digital educational tools. Particular attention is paid to the development of critical and spatial thinking, environmental literacy, and research skills. The course is aimed at enabling students to design and implement innovative geographical education programs that address global challenges and societal needs.

Learning Outcomes in EP (LOP):

LOP 1 – Integrates scientific results into educational content, taking into account the interconnection between science and the educational process, current issues in the history and philosophy of science, the professional foundations of speech communication, and the observance of ethical and legal standards in the use of artificial intelligence under conditions of educational transformation.

LOP 5 – Designs a digital learning module, an instructional package, and an assessment system based on the principles of digital transformation and pedagogical design in geographical education.

Learning Outcomes in Course/Discipline (LOD):

LOD 1 – Analyzes the theoretical and methodological foundations of modern geography education and its key development concepts.

LOD 2 – Applies competency-based pedagogical models, digital technologies, and geographic information systems to update the content of geography education.

LOD 3 – Designs learning processes using innovative and practice-oriented teaching methods, fostering students' critical, spatial, and environmental thinking skills.

LOD 4 – Develops innovative geography education programs in response to global challenges and societal needs and justifies their effectiveness.

Post requisites: IS 71506/1 Modern paradigm of geographical education

2. OPTIONAL COMPONENT OF THE CYCLE OF MAJOR COURSES



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Component of choice 1

Course: Political Geography and Globalization of the Modern World

Intensity of the Course: 5 academic credits

Module Code: MGG 51506/1

Module Name: Management of Global Geopolitical, Geoeconomic and Geoecological Processes

Prerequisites: EGP 404/1 Geopolitics and Geourbanistics

Purpose: To develop among master's students the scientific and applied foundations for analyzing the geopolitical and geo-economic situation in the world, to build skills in assessing global trends and the balance of world powers, and to apply spatial analysis methods for developing scenarios of development and the regulation of international processes.

Short Description: The discipline is aimed at the comprehensive study of the theoretical foundations of political geography and the spatial patterns of political processes in the context of globalization. The course examines geopolitical concepts, the system of international relations, the territorial organization of states, changes in political borders, and international conflicts. It also analyzes the impact of global economic and information flows on the world political map, as well as the role of international organizations and non-governmental actors. Master's students acquire skills in geopolitical analysis, political cartography, and spatial analysis tools, enhancing their ability to critically assess global challenges. Particular attention is paid to the interpretation of territorial identity, sovereignty, and sustainable development issues within a geographical context.

Learning Outcomes in EP (LOP):

LOP 6 – Evaluates the development status of states and regions and models strategic development scenarios based on spatial-analytical interpretation of global and regional geopolitical dynamics.

Learning Outcomes in Course/Discipline (LOD):

LOD 1 – Applies geopolitical, geo-economic, and spatial analysis methods, including cartographic and GIS tools, to assess the position of countries and regions within the system of international political, economic, and cultural relations.

LOD 2 – Justifies and applies classical and contemporary geopolitical concepts for analyzing global and regional processes, including the impact of economic, informational, and socio-cultural factors on international relations and national security.

LOD 3 – Analyzes and interprets the dynamics of geopolitical processes, identifying the causes and patterns of regional contradictions, conflicts, and transformations of the world political map.

LOD 4 – Develops applied analytical materials and development scenarios for states and regions, including options for conflict resolution, resource-territorial disputes, and forecasting geopolitical changes.

Post requisites: MGG 62506/1 World economy and international relations

Component of choice 1

Course: Political geography with geopolitics bases

Intensity of the Course: 5 academic credits

Module Code: MGG 51506/2

Module Name: Management of Global Geopolitical, Geoeconomic and Geoecological Processes

Prerequisites: EGP 404/1 Geopolitics and Geourbanistics



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Purpose: To develop scientific and applied skills in analyzing the spatial organization of political processes, geopolitical patterns of development of states and regions, and the ability to assess contemporary challenges and transformations of the global political space.

Short Description: The course is aimed at developing a systemic understanding among masters of the spatial organization of political processes, the territorial structure of power, and international relations within a geographical context. It combines theoretical and applied aspects of political geography and geopolitics, enabling masters to analyze global and regional conflicts, the strategic interests of states, and the processes of integration and disintegration on the world map. Special attention is given to contemporary geopolitical challenges, the transformation of the global order, and the role of natural resources, borders, transport corridors, cultural and civilizational factors in shaping political space. The course fosters analytical and strategic thinking skills essential for careers in international relations, national and local governance, territorial planning, as well as research and expert-analytical work.

Learning Outcomes in EP (LOP):

LOP 6 – Evaluates the development status of states and regions and models strategic development scenarios based on spatial-analytical interpretation of global and regional geopolitical dynamics.

Learning Outcomes in Course/Discipline (LOD):

LOD 1 – Applies political-geographical, geopolitical, and spatial analysis methods to assess the territorial organization of power, political processes, and international relations at global and regional levels.

LOD 2 – Justifies and applies classical and contemporary geopolitical concepts to analyze states' strategic interests, integration processes, and the transformation of the global political space.

LOD 3 – Analyzes the influence of natural-resource, transport-geographical, cultural, and civilizational factors on the formation of political space, regional contradictions, and international conflicts.

LOD 4 – Develops analytical materials and scenarios for geopolitical processes, including the assessment of contemporary challenges, risks, and prospects for the territorial and political development of states and regions.

Post requisites: MGG 62506/1 World economy and international relations

Component of choice 2

Course: **Geo-economic aspects of the strategic development of the region**

Intensity of the Course: 5 academic credits

Module Code: MGG 61506/1

Module Name: Management of Global Geopolitical, Geoeconomic and Geoecological Processes

Prerequisites: EGP 301 Economic and Social Geography of Kazakhstan

Purpose: To develop scientific and applied skills in geo-economic analysis of regions, assessment of territorial competitiveness factors, and application of spatial methods to substantiate strategic directions of regional development and support managerial decision-making.

Short Description: The discipline focuses on the comprehensive study of territorial economic processes and their role in the strategic development of regions. The course examines factors of geo-economic competitiveness, territorial specialization, transport and logistics infrastructure, resource provision, and investment attractiveness. Regional policy, interregional interaction, and strategic planning tools are analyzed using spatial analysis and Geographic Information Systems (GIS). Master's students acquire skills in processing spatial data,



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developing geo-economic indicator systems, and applying cartographic modeling techniques to regional development processes. In addition, they enhance their abilities in assessing territorial potential and risks, interpreting results of digital spatial analysis, and making evidence-based managerial decisions.

Learning Outcomes in EP (LOP):

LOP 6 – Evaluates the development status of states and regions and models strategic development scenarios based on spatial-analytical interpretation of global and regional geopolitical dynamics.

LOP 7 – Interprets structural changes in geographical-economic space and territorial development patterns through systemic analysis and compiles a set of evidence-based strategic solutions for regional planning and governance.

Learning Outcomes in Course/Discipline (LOD):

LOD 1 – Applies geo-economic, spatial, and statistical analysis methods, including GIS technologies, to assess regional socio-economic development and competitive advantages.

LOD 2 – Analyzes the influence of resource potential, transport and logistics infrastructure, investment attractiveness, and interregional linkages on the strategic development of territories.

LOD 3 – Develops a system of geo-economic indicators, processes spatial data, and interprets the results of cartographic modeling of regional development processes.

LOD 4 – Assesses the territorial potential and risks of regional development and develops analytical materials and recommendations to support informed managerial decision-making.

Post requisites: IS 72506/2 International Relations and Geopolitics

Component of choice 2

Course: Regional development, planning and management

Intensity of the Course: 5 academic credits

Module Code: MGG 61506/2

Module Name: Management of Global Geopolitical, Geoeconomic and Geoecological Processes

Prerequisites: EGP 301 Economic and Social Geography of Kazakhstan

Purpose: To develop scientific and applied skills in analyzing regional development, territorial planning, and governance processes, as well as the ability to design and justify managerial decisions aimed at the sustainable socio-economic development of territories.

Short Description: The discipline focuses on the comprehensive study of the theoretical and methodological foundations of regional development, planning, and governance. The course examines the goals and instruments of regional policy, territorial planning systems, the interaction between governance levels, and mechanisms for organizing socio-economic space. The discipline emphasizes institutional governance, regional planning procedures, and public regulation mechanisms. Master's students acquire skills in developing territorial planning documents, analyzing regional programs, and justifying managerial decisions. In addition, they enhance their abilities to assess regional development processes and apply effective governance models.

Learning Outcomes in EP (LOP):

LOP 7 – Interprets structural changes in geographical-economic space and territorial development patterns through systemic analysis and compiles a set of evidence-based strategic solutions for regional planning and governance.

Learning Outcomes in Course/Discipline (LOD):

LOD 1 – Applies theoretical approaches and methods of regional development analysis to assess the socio-economic conditions of territories and identify development factors.



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LOD 2 – Analyzes the mechanisms of regional policy, territorial planning, and multi-level governance in the organization of socio-economic space.

LOD 3 – Develops and evaluates territorial planning documents, regional programs, and development projects using modern management methods and tools.

LOD 4 – Justifies managerial decisions and recommendations based on the assessment of regional development effectiveness, government regulatory mechanisms, and territorial governance models.

Post requisites: IS 72506/2 International Relations and Geopolitics

Component of choice 3

Course: World economy and international relations

Intensity of the Course: 5 academic credits

Module Code: MGG 62506/1

Module Name: Management of Global Geopolitical, Geoeconomic and Geoecological Processes

Prerequisites: EGP 302 Economic, Social Geography of the World

Purpose: To develop scientific and applied skills in analyzing world economic processes and international relations, assessing the impact of global economic and political factors on world development, and making strategic decisions based on international data and indicators.

Short Description: The discipline focuses on the comprehensive study of the main processes and structures of the world economy, as well as the dynamics of the international relations system. The course examines globalization processes, international trade, financial markets, state economic policies, and the activities of international organizations. It also analyzes the interaction between economic and political factors, as well as their role in shaping international cooperation and generating geopolitical conflicts. Particular attention is paid to quantitative analysis of global data, the use of international indicator systems, and modeling of global economic processes. Master's students acquire skills in interpreting global economic data, analyzing international events, and making informed strategic decisions in a rapidly changing world.

Learning Outcomes in EP (LOP):

LOP 6 – Evaluates the development status of states and regions and models strategic development scenarios based on spatial-analytical interpretation of global and regional geopolitical dynamics.

LOP 7 – Interprets structural changes in geographical-economic space and territorial development patterns through systemic analysis and compiles a set of evidence-based strategic solutions for regional planning and governance.

Learning Outcomes in Course/Discipline (LOD):

LOD 1 – Applies economic and political analysis methods to assess the processes of the world economy, international trade, global financial markets, and international cooperation.

LOD 2 – Analyzes the impact of globalization, national economic policies, and the activities of international organizations on the development of the world economy and the system of international relations.

LOD 3 – Uses international statistical databases, global indicator systems, and quantitative analysis methods to interpret global economic and political processes.

LOD 4 – Develops analytical materials and justifies strategic decisions considering contemporary global challenges, international risks, and trends in world development.

Post requisites: IS 72506/2 International Relations and Geopolitics

Component of choice 3



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Course: Geographical problems of management and forecast in environmental management

Intensity of the Course: 5 academic credits

Module Code: MGG 62506/2

Module Name: Management of Global Geopolitical, Geoeconomic and Geoecological Processes

Prerequisites: EGP 302 Economic, Social Geography of the World

Purpose: To develop scientific and applied skills in analyzing, forecasting, and managing natural resource use processes based on environmental risk assessment, spatial analysis, and the principles of sustainable territorial development.

Short Description: The discipline is aimed at studying the geographical foundations of natural resource management and forecasting its consequences. The course examines the spatial aspects of natural resource use, environmental risks, sustainable development issues, and territorial planning. Particular attention is given to environmental impact assessment methods, spatial analysis tools (including GIS technologies), and the development of management decisions. The course develops in master's students a systematic understanding of the interaction between nature and society, as well as practical skills in analysis and forecasting in the field of sustainable natural resource management.

Learning Outcomes in EP (LOP):

LOP 8 – Analyzes the spatial organization of geoecological systems and anthropogenic impacts, constructs an ecological risk assessment model, and proposes sustainable development policy recommendations.

LOP 10 – Builds predictive models, performs scenario analysis, and prepares analytical reports assessing the dynamics of natural and socio-economic processes based on the integration of applied geostatistics and spatial modeling methods.

Learning Outcomes in Course/Discipline (LOD):

LOD 1 – Applies geographic, environmental, and spatial analysis methods, including GIS technologies, to assess the condition of natural resources and natural resource management processes.

LOD 2 – Analyzes environmental risks and the impacts of economic activities and justifies approaches to rational natural resource use and sustainable territorial development.

LOD 3 – Uses methods of environmental impact assessment, spatial data processing, and forecasting changes in natural and human-modified environmental systems.

LOD 4 – Develops analytical materials and management recommendations for regulating natural resource use, reducing environmental risks, and enhancing the environmental sustainability of territories.

Post requisites: IS 72506/2 International Relations and Geopolitics

Component of choice 4

Course: Cartographic support of scientific research

Intensity of the Course: 5 academic credits

Module Code: GTS 52506/1

Module Name: Geoinformation Technologies and Spatial Data Analysis

Prerequisites: MGS 51506/1 Planning and organization of scientific research

Purpose: Development of master's students' skills in designing simple and complex cartographic models for geographical research.

Short Description: The discipline is aimed at developing professional competencies among master's students in the field of cartographic support for scientific research activities. The course examines the theoretical and applied foundations of cartographic methods and technologies used



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in scientific research, as well as approaches to the development, analysis, and interpretation of cartographic materials. Master's students acquire knowledge and practical skills in the use of digital cartography and Geographic Information Systems (GIS), and learn to select effective cartographic tools in accordance with research aims and objectives. Particular attention is paid to the visualization of spatial data, the cartographic presentation of scientific information, and the evidence-based analysis of research results. In addition, the discipline develops practical skills in designing maps, cartodiagrams, and thematic cartographic materials required for the high-quality presentation of scientific research outcomes.

Learning Outcomes in EP (LOP):

LOP 3 – Presents the structure, methodology, data, and conclusions of the research in accordance with academic standards, while observing ethical norms at all stages of the scientific process.

LOP 4 – Constructs a scientific-analytical model explaining the interrelationships between natural and socio-geographical systems and defines a research concept based on the integration of theoretical and methodological foundations of geographical science and paradigms of spatial research.

LOP 9 – Develops interactive cartographic products and implements geoanalytical research projects based on the integration of geographic information systems and spatial data technologies.

Learning Outcomes in Course/Discipline (LOD):

LOD 1 – Applies cartographic methods and modern geospatial technologies to collect, process, and analyse spatial data, and develops cartographic models in accordance with the objectives of scientific research.

LOD 2 – Evaluates the quality, accuracy, informativeness, and scientific validity of cartographic materials; selects and justifies cartographic representation methods according to research objectives.

LOD 3 – Uses GIS and digital cartography software to develop thematic maps, cartodiagrams, cartographic models, and other visualization tools for presenting scientific research results.

LOD 4 – Presents research findings in cartographic form, interprets spatial patterns, substantiates the scientific and practical value of cartographic products, and effectively applies them in scientific publications and research projects.

Post requisites: MGS 61506/1 Geographical modeling

Component of choice 4

Course: Environmental management in the context of globalization

Intensity of the Course: 5 academic credits

Module Code: GTS 52506/2

Module Name: Geoinformation Technologies and Spatial Data Analysis

Prerequisites: MGS 51506/1 Planning and organization of scientific research

Purpose: Development of master's students' skills in managing sustainable natural resource use under globalization, assessing environmental risks, and developing management decisions based on the principles of sustainable development.

Short Description: The course explores the specifics of environmental management in the context of globalization and interdependence among countries. It examines global environmental challenges, international norms, and sustainable development strategies. Special emphasis is placed on integrating environmental, economic, and social factors into decision-making processes. The course aims to develop master's skills in analyzing natural resources, assessing



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environmental risks, and designing effective management models that consider both global trends and regional characteristics of natural resource use.

Learning Outcomes in EP (LOP):

LOP 7 – Interprets structural changes in geographical-economic space and territorial development patterns through systemic analysis and compiles a set of evidence-based strategic solutions for regional planning and governance.

LOP 8 – Analyzes the spatial organization of geoecological systems and anthropogenic impacts, constructs an ecological risk assessment model, and proposes sustainable development policy recommendations.

Learning Outcomes in Course/Discipline (LOD):

LOD 1 – Applies the theoretical foundations of natural resource management under globalization, the principles of international environmental policy, and sustainable development concepts to comprehensively analyse natural resource use systems.

LOD 2 – Identifies environmental risks associated with resource utilization, and scientifically substantiates their consequences.

LOD 3 – Develops effective management models and management decisions using modern natural resource management methods and tools based on international and regional best practices.

LOD 4 – Evaluates the environmental, economic, and social effectiveness of natural resource management strategies from the perspective of sustainable development principles, scientifically substantiates the findings and applies the results in professional practice.

Post requisites: MGS 61506/2 Geoecological marketing

Component of choice 5

Course: Web mapping

Intensity of the Course: 5 academic credits

Module Code: GTS 61506/1

Module Name: Geoinformation Technologies and Spatial Data Analysis

Prerequisites: EGP 303/1 Geographic Information Systems

Purpose: To develop scientific and applied skills in designing, visualizing, and publishing geospatial data in web environments using modern web mapping technologies and geographic information systems.

Short Description: The discipline focuses on the theoretical and applied foundations of web cartography, spatial data visualization in online environments, and the development of interactive cartographic services. The course examines web map design, publication of geospatial data, web-GIS platforms, cartographic APIs, and tools for creating digital cartographic applications. Master's students acquire skills in geodata integration, cartographic interface design, and spatial data visualization using OpenStreetMap, Leaflet, Mapbox, QGIS, and ArcGIS Online. In addition, students enhance their abilities to develop scientific and educational projects using web cartography tools.

Learning Outcomes in EP (LOP):

LOP 9 – Develops interactive cartographic products and implements geoanalytical research projects based on the integration of geographic information systems and spatial data technologies.

Learning Outcomes in Course/Discipline (LOD):

LOD 1 – Applies web mapping and web-GIS methods and tools to integrate, process, visualize, and publish geospatial data in online environments.

LOD 2 – Analyzes and evaluates the cartographic quality, interactivity, functionality, and user experience of web maps and web-GIS projects.



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7M01506-Geography

Catalog of elective disciplines

LOD 3 – Develops original web mapping products and interactive services using cartographic APIs, web-GIS platforms, and modern software tools to address scientific and applied tasks.

LOD 4 – Designs web-GIS projects tailored to specific application domains (e.g., ecology, urban studies, transport, and spatial planning) and justifies their effectiveness for scientific or practical implementation.

Post requisites: IS 72506/1 Web-GIS

Component of choice 5

Course: Geoinformation technologies in geographical research

Intensity of the Course: 5 academic credits

Module Code: GTS 61506/2

Module Name: Geoinformation Technologies and Spatial Data Analysis

Prerequisites: EGP 303/1 Geographic Information Systems

Purpose: To develop scientific and applied skills in the application of geoinformation technologies for the collection, processing, analysis, modeling, and visualization of spatial data, as well as for the development of research projects and spatially informed decision-making.

Short Description: The discipline focuses on the theoretical and applied foundations of using Geographic Information Systems (GIS) in geographical research. The course examines methods for collecting, processing, storing, analyzing, and visualizing spatial data, as well as approaches to digital cartography, spatial modeling, and the use of remote sensing data. Master's students acquire skills in applying modern GIS platforms and geospatial tools to solve scientific and applied problems. Particular attention is paid to the interpretation of spatial analysis results, the development of cartographic materials, and the digital modeling of geographical processes. In addition, students enhance their abilities to develop GIS-based research projects and make spatially informed decisions.

Learning Outcomes in EP (LOP):

LOP 9 – Develops interactive cartographic products and implements geospatial research projects based on the integration of geographic information systems and spatial data technologies.

LOP 10 – Builds predictive models, performs scenario analysis, and prepares analytical reports assessing the dynamics of natural and socio-economic processes based on the integration of applied geostatistics and spatial modeling methods.

Learning Outcomes in Course/Discipline (LOD):

LOD 1 – Applies modern GIS platforms, remote sensing data, and spatial analysis methods to collect, process, integrate, and visualize geographic data.

LOD 2 – Analyzes and interprets the results of spatial analysis and geospatial modeling, assessing patterns in natural and socio-economic processes.

LOD 3 – Develops digital cartographic products, spatial models, and geoinformation solutions for scientific research and applied problem-solving.

LOD 4 – Designs GIS-based research projects, evaluates the effectiveness of spatial solutions, and assesses their potential for practical implementation.

Post requisites: IS 72506/1 Web-GIS

Component of choice 6

Course: Applied Geostatistics

Intensity of the Course: 5 academic credits

Module Code: GTS 62506/1

Module Name: Geoinformation Technologies and Spatial Data Analysis



KAZAKH NATIONAL WOMEN'S TEACHER TRAINING UNIVERSITY
DEPARTMENT OF NATURAL SCIENCES

7M01506-Geography

Catalog of elective disciplines

Prerequisites: EGP 404/2 Applied Geography

Purpose: To develop scientific and applied skills in applying geostatistical methods, digital modeling, and spatial forecasting for the analysis of geographic data, the development of analytical solutions, and the justification of scientific conclusions.

Short Description: The discipline focuses on digital and automated approaches in applied geostatistics for the analysis, modeling, and forecasting of spatial data. The course examines geostatistical methods (kriging, IDW), variogram analysis, spatial interpolation, and techniques for assessing spatial distribution patterns of geographic phenomena. Master's students acquire skills in processing large spatial datasets using Geographic Information Systems (GIS), digital modeling, algorithmic analysis, and automated geostatistical computations. Particular attention is paid to implementing geostatistical models in Python/R environments, cartographic visualization of results, and interpretation of spatial forecasts. In addition, students enhance their abilities to apply digital geostatistical tools to solve applied problems and support scientifically grounded decision-making.

Learning Outcomes in EP (LOP):

LOP 10 – Builds predictive models, performs scenario analysis, and prepares analytical reports assessing the dynamics of natural and socio-economic processes based on the integration of applied geostatistics and spatial modeling methods.

Learning Outcomes in Course/Discipline (LOD):

LOD 1 – Applies geostatistical methods and digital tools for spatial data analysis, including variogram analysis, interpolation techniques, and the assessment of spatial patterns.

LOD 2 – Analyzes the spatial distribution of natural and socio-economic phenomena using geographic information systems and geostatistical approaches.

LOD 3 – Develops geostatistical models and algorithms in Python and R environments for processing, forecasting, and visualizing spatial data.

LOD 4 – Interprets the results of geostatistical analysis and spatial forecasting, justifies scientific conclusions and recommendations, and supports spatially informed decision-making for applied problem-solving.

Post requisites: ORW 73 In-depth study of statistical analysis methods

Component of choice 6

Course: Statistics of environment

Intensity of the Course: 5 academic credits

Module Code: GTS 62506//2

Module Name: Geoinformation Technologies and Spatial Data Analysis

Prerequisites: EGP 404/2 Applied Geography

Purpose: To develop scientific and applied skills in the statistical analysis of environmental data, assessment of environmental conditions and environmental risks, and the justification of managerial decisions based on quantitative research methods.

Short Description: The discipline focuses on the methods of collecting, processing, and analyzing statistical indicators describing the state of the environment. The course examines the structure of environmental data, environmental quality indicators, and methods of temporal and spatial statistical analysis. Master's students acquire skills in interpreting environmental monitoring data, applying statistical models, and quantitatively assessing natural and anthropogenic processes. Particular attention is paid to statistical assessment of environmental risks, data visualization, and justification of scientific conclusions. In addition, students enhance their abilities to support decision-making and environmental management processes based on environmental statistics.

Learning Outcomes in EP (LOP):



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DEPARTMENT OF NATURAL SCIENCES

7M01506-Geography

Catalog of elective disciplines

LOP 8 – Analyzes the spatial organization of geoecological systems and anthropogenic impacts, constructs an ecological risk assessment model, and proposes sustainable development policy recommendations.

LOP 10 – Builds predictive models, performs scenario analysis, and prepares analytical reports assessing the dynamics of natural and socio-economic processes based on the integration of applied geostatistics and spatial modeling methods.

Learning Outcomes in Course/Discipline (LOD):

LOD 1 – Applies statistical analysis methods to collect, process, organize, and interpret data characterizing environmental conditions and natural-human processes.

LOD 2 – Analyzes temporal and spatial patterns of environmental indicators using quantitative analysis methods and environmental monitoring data.

LOD 3 – Uses statistical models and visualization techniques to assess environmental risks, identify driving factors, and forecast environmental changes.

LOD 4 – Develops recommendations to support environmental management and decision-making based on the results of statistical analysis of environmental data.

Post requisites: ORW 73 In-depth study of statistical analysis methods