Bachelor's Track Program: Economics and Econometrics

1. Open Doors winner's skill set

The winner must have a high level of theoretical training in the field of economics, which can be demonstrated when solving problems of various types and levels of complexity related to the analysis of the functioning of socioeconomic systems and their financial support; management and forecasting of future states using mathematical analysis and probabilistic methods. The winner must be able to use basic applied skills in collecting and processing statistical data obtained at the micro or macro level; demonstrate deep knowledge of mathematics, critical thinking, and analytical skills, as well as clearly know the principles of economic functioning and be able to apply them to solve problems.

2. List of degree programs covered by the subject area

2.1.List of bachelor's degree programs

38.03.01 Economics
38.03.05 Business Informatics
01.03.05Statistics

2.2. List of specialist's degree programs

38.05.01 Economic Security

3. Content

Field of science 1. Economic theory
Social studies

1. Introduction to economic theory: economics and the economy; needs and their types; limited resources; economic choice; economic efficiency; social institutions; property as a fundamental economic institution; entrepreneurship as an institution and its role in the economy; types of economic systems.
2. Microeconomics: market; market mechanisms and pricing; supply and demand and their key factors; law of demand and law of supply; elasticity of supply and demand; normal goods, essential goods, and luxury goods; Giffen goods and the Veblen effect; markets for factors of production—labor, capital, land, and information; competition as the foundation of market functioning; types of market structures; the firm in the economy; objectives of the firm and its economic goals; production; factors of production and factor incomes; opportunity cost; costs and their types; public goods; excludability and competitiveness in consumption; market imperfections; externalities.
3. Macroeconomics: economic activity and economic agents; households, firms, and the state; consumption, savings, and investment; rational behavior of economic agents; key economic issues; the government in the economy; economic functions of the government; economic growth and ways for its achievement; measuring economic growth; economic cycle and its phases; inflation and unemployment; fiscal policy; government budget; government budget deficit and surplus; the principle of a balanced government budget; government debt; monetary policy.
4. Principles of economic statistics: data generated by economic agents; indicators of the firm's activity in the system of economic relations; market activity indicators in the system of economic relations; economic indicators of consumer behavior in the system of economic relations; key macroeconomic indicators—gross domestic product (GDP), gross national income (GNI); relationship between GDP and GNI; real and nominal GNI; macroeconomic indicators and quality of life; inflation measurement; key demographic indicators and the labor market.

Field of science 2. Finance
Social studies

1. Finance and the financial system: financial markets, their types and functions; stock market; money market; financial institutions; financial services; deposits and loans; digital financial services; financial technologies and financial security; digital financial assets; securities; individual budget and principles of its formation; methods and sources of financing a firm; indicators of the firm's performance.
2. Banking system: banks; banking system; central bank: goals and functions; monetary aggregates; money supply and monetary base; money multiplier; banking services provided to citizens: deposit, credit, bank card, electronic money, money transfer, and currency exchange; forms of remote banking services: ATM, mobile banking, and online banking.

Field of science 3. International economics
Social studies

1. Basic elements of international economics; the world economy and factors affecting it; participants in the world economy: developed and developing countries in the world economy, international organizations, integration associations, and TNCs; indicators of global economic development; international division of labor: concept, trends, and factors; basic forms of international economic relations.
2. International trade: international trade; basic concepts, indicators, principles, and factors; volume, structure, and trends of international trade; export and import of goods and services; indicators of international trade development; gains and losses from participation in international trade; government regulation of foreign trade; territorial structure of the world economy and spatial specialization; resources in the global economy; concept of trade policy, liberalism, and protectionism; tariff and non-tariff methods of regulating foreign trade; role of WTO in regulating international trade.

Field of science 4. Mathematical, statistical, and instrumental methods in economics
Mathematics

1. Numbers and calculations: rational numbers; common and decimal fractions, percentages, and infinite periodic fractions; using fractions and percentages to solve applied problems across disciplines and in everyday life; real numbers; rational and irrational numbers; arithmetic operations with real numbers; modulus of a real number and its properties; approximate calculations, rounding rules, and estimation and evaluation of calculation results; power with an integer exponent; Newton's binomial theorem; using appropriate representations of real numbers to solve practical problems and display data; arithmetic root of a natural exponent and its properties; power with a rational exponent and its properties; power with a real exponent; logarithm of a number; properties of the logarithm; decimal and natural logarithms.
2. Equations and inequalities: identities and identity transformations; equation, root of equation; equivalent equations and consequence equations; inequalities and their solutions; basic methods for solving integer and fractional rational equations and inequalities; polynomials in a single variable; dividing a polynomial by a polynomial with a remainder; Bézout's theorem; polynomials with integer coefficients; Vieta's theorem; transformations of numerical expressions containing powers and roots; irrational equations; basic methods for solving irrational equations; exponential equations; basic methods for solving exponential equations; transformation of expressions containing logarithms; logarithmic equations; basic methods for solving logarithmic equations; solving systems of linear equations; matrix of a system of linear equations; determinant of a 2×2 matrix: its geometric interpretation, properties, and computation; using the determinant to solve systems of linear equations; solving applied problems using systems of linear equations; analyzing

constructed models using matrices and determinants; constructing mathematical models of real-world situations using equations and inequalities; applying equations and inequalities to solve mathematical problems and problems from various fields of science and real life; systems and sets of equations and inequalities; equivalent systems and consequence systems; equivalent inequalities; basic methods for solving exponential and logarithmic inequalities; basic methods for solving irrational inequalities; basic methods for solving systems and sets of rational, irrational, exponential, and logarithmic equations; equations, inequalities, and systems with parameters; applying equations, systems of equations, and inequalities to solve mathematical problems and problems from various fields of science and real life, and interpreting the results.

3. Functions and graphs: functions and methods for defining a function; mutually inverse functions; composition of functions; graph of a function; graph of a composition of functions; elementary transformations of function graphs; domain and range of a function; zeros of a function; intervals of constant sign; even and odd functions; periodic functions; intervals of a function's monotonicity; maxima and minima of a function; the maximum and minimum values of a function on an interval; linear, quadratic, and fractional-linear functions, these functions elementary analysis and their corresponding graphs; power functions with natural and integer exponents, their properties and graph; properties and graph of the *n*th root as a function of the inverse power with a natural exponent; exponential and logarithmic functions, their properties and graphs; using graphs of functions in solving equations; functional dependencies in real processes and phenomena; graphs of real dependencies; geometric images of equations and inequalities on the coordinate plane; graphical methods for solving equations and inequalities; graphical methods for solving problems with parameters; using function graphs to study processes and dependencies that arise when solving problems across disciplines and in real life.

4. Basics of calculus: arithmetic and geometric progressions; infinitely decreasing geometric progressions; sum of a convergent geometric series; linear and exponential growth; the number e; compound interest formula; using progressions to solve practical real-world problems; first and second derivatives of a function; definition, geometric and physical interpretations of the derivative; equation of the tangent to a function's graph; derivatives of elementary functions; derivative of a sum, product, quotient, and composition of functions; application of the derivative to analyzing functions for monotonicity and extrema; finding the maximum and minimum values of a continuous function on an interval; using the derivative to find optimal solutions in applied problems, to determine the speed and acceleration of a process defined by a formula or graph; examples of solutions of differential equations; mathematical modeling of real processes using differential equations.

5. Probability and statistics: random experiments (trials) and random events; elementary events (outcomes); probability of a random event; closeness of frequency and probability of an event; random experiments with equally probable elementary events; operations on events: intersection, union, and complementary events; Euler diagrams; addition rule for probabilities; conditional probability; multiplication of probabilities; formula of total probability; Bayes' formula; independent events; binary random experiment (trial): outcomes of success and failure; independent trials; series of independent trials until the first success; permutations and the factorial; number of combinations; Pascal's triangle; Newton's binomial formula; series of independent Bernoulli trials; random sample from a finite population; random variable; probability distribution; distribution diagram; operations with random variables; binary random variable; examples of distributions, including geometric and binomial; joint distribution of two random variables; independent random variables; expected value of a random variable (distribution); examples of application of the expected value (insurance, lotteries); expected value of a binary random variable; expected value of the sum of random variables; expected value of geometric and binomial distributions; expected value and standard deviation of a random variable (distribution); variance of a binary random variable; expected value of the product and variance of the sum of

independent random variables; expected value and standard deviation of the binomial distribution and the geometric distribution; sampling as a research method; sample characteristics; estimating the probability of an event based on sample data; testing the simplest hypotheses using the studied distributions.

Field of science 5. Regional and sectoral economics
Social studies

1. Regional economics: influence of region's resources on its economic development; spatial organization of the national economy; economic specialization of regions; key factors of regional development; economic resources and regional specialization.
2. Sectoral economics: industry, its concept and types; types of industry markets; sectoral features of the use of production resources; factors of production determining the level of industry development; technological progress and industry development; industrial specialization and regional economy; economic resources and industrial specialization.

4. Preparation materials

1.1. Recommended reading

Field of science 1. Economic theory

Reading list in English
1. Greenlaw S. A.. Principles of Economics 2e. – 2nd ed. OpenStax, 2017. 974 p. URL: https://www.infobooks.org/pdfview/15837-principles-of-economics-2e-steven-a-greenlaw/
2. Kishtainy N., et al. The Economics Book: Big Ideas Simply Explained. DK Publishing, 2012. 351 p. URL: https://archive.org/details/1.-the-economics-book-big-ideas-simply-explained-by-dk-niall-kishtainy-george-ab/1.%20The%20Economics%20Book%20%28Big%20Ideas%20Simply%20Explained%29%20by%20DK%2C%20Niall%20Kishtainy%2C%20George%20Abbot%2C%20John%20Farndon%2C%20Frank%20Kennedy%2C%20James%20Meadway%2C%20Christopher%20Wallace%2C%20Marcus%20Weeks%20%28z-lib.org%29/page/n1/mode/2up
3. McConnell C.R., Brue S.L. Economics: principles, problems, and policies - 17th ed. McGraw-Hill: Irwin. 2008. 870 p. URL: https://archive.org/details/mcconnell-brue-economics-17th-edition/page/n1/mode/2up

Field of science 2. Finance

Reading list in English
1. Mitsel A. A. Basics of Financial Mathematics. Tomsk: National research Tomsk University, 2012. 145 p. URL: https://www.infobooks.org/pdfview/6938-basics-of-financial-mathematics-a-a-mitsel/
2. Murray T. Business Finance. Virginia military institute, 2022. 104 p. URL: https://www.infobooks.org/pdfview/business-finance-tim-murray-271/
3. Rabbior G. A Guide to Financial Literacy. Toronto: Canadian Foundation for Economic Education, 2018. 223 p. URL: https://www.infobooks.org/pdfview/a-guide-to-financial-literacy-gary-rabbior-46/

Field of science 3. International economics

Reading list in English
1. Carbaugh R. J. International Economics 13e. Central Washington University, 2010. 580 p.

URL: https://wyamaka.wordpress.com/wp-content/uploads/2019/08/international-economics_30.pdf
2. Krugman P., Obstfeld M., Melitz J. International Economics Theory & Policy. Rotterdam: Erasmus Universiteit, 2012. 274 p. URL: https://cdn.prexams.com/8979/International%20Economics%20Theory%20and%20Policy%20Book%20Summary%209th%20Edition.pdf
3. World Economic Outlook. WMF, 2025. URL: https://www.imf.org/en/Publications/WEO

Field of science 4. Mathematical, statistical and instrumental methods in economics

Reading list in English
1. Grines V., Gurevich E., Pochinka O. Precalculus/ Study book. Nizhni Novgorod: Lobachevsky State University of Nizhni Novgorod, 2012. 119 p. URL: http://www.unn.ru/books/met_files/precalculus.pdf
2. Keller G. Statistics for management and economics abbreviated. Mason: South-Western Cengage Learning, 2012. 244 p. URL: https://gimmenotes.co.za/wp-content/uploads/2017/07/STA1501-_statistics_for_management_and_economics_9th_chp_1-6.pdf
3. Zorine A.V. Eight lectures in probability theory and mathematical statistics. A course book. Nizhni Novgorod: Lobachevsky State University of Nizhni Novgorod, 2014. 108 p. URL: http://www.unn.ru/books/met_files/PTMScoursebook.pdf

Field of science 5. Regional and sectoral economics

Reading list in English
1. Cabral L. Introduction to industrial organization. Cambridge, Mass.: MIT Press. 2017. 442p. URL: https://studylib.net/doc/25937153/introduction-to-industrial-organization.2ed.cabral.book17
2. Eberhard F., et al. Economic Sectors and Services. Cambridge: Cambridge University Press, 2014, 50 p. URL: https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap10_FINAL.pdf
3. Grinevich Y.A. Regional economy and policy. Nizhny Novgorod: Lobachevsky State University of Nizhni Novgorod, 2017. 51 p. URL: http://www.unn.ru/books/met_files/Regional%20Economy%20and%20Policy.pdf

1.2. Recommended online courses

Field of science 1. Economic theory

Online courses in English	**Link**	**Course description**
1. Principles of Microeconomics (Coursera)	URL: https://www.coursera.org/learn/microeconomics	This course provides an introduction to microeconomics. It consists of several thematic modules: introduction and main principles of microeconomics, and supply and demand. Each module includes video lectures, reading materials, assignments, and discussion prompts.
2. Introduction to Economic Theories	URL: https://www.coursera.	This course provides an introduction to economic theory. It consists of several

(Coursera)	org/learn/intro-economic-theories	thematic modules: individuals, households and consumers; firms and markets; the state; real and monetary economy; and growth and trade. Each module includes video lectures and assignments.
3. Public Economics (Open Education)	URL: https://openedu.ru/course/hse/PUBECONOM	This course provides an introduction to public economics. It consists of several thematic modules: government in a market economy; design of government: a tax theory primer; scope of government; politics of public economics; working of the government; and government and society. Each module includes video lectures, and reading materials.

Field of science 2. Finance

Online courses in English	Link	Course description
1. Introduction to Finance: The Basics (Coursera)	URL: https://www.coursera.org/learn/introduction-to-finance-the-basics	This course provides an introduction to finance. It consists of several thematic modules: introduction to finance, financial statement and cash flow, and time value of money. Each module includes video lectures, reading materials, and assignments.
2. Fundamentals of Finance (Coursera)	URL: https://www.coursera.org/learn/finance-fundamentals-uci	This course provides an introduction to fundamentals of finance. It consists of several thematic modules: financial statements; probability, profitability, cash flow; and forecasting and financing. Each module includes video lectures, reading materials, assignments, and discussion prompts.
3. Financial Markets (Coursera)	URL: https://www.coursera.org/learn/financial-markets-global	This course provides an introduction to financial markets. It comprises of several thematic modules: risk management and behavioral finance; securities; and insurance and banking industries. Each module includes video lectures and assignments.

Field of science 3. International economics

Online courses in English	Link	Course description
1. Business, International Relations and the Political Economy (Edx)	URL: https://www.edx.org/executive-	This course provides an introduction to business, international relations, and the political economy. It consists of

	education/the-london-school-of-economics-and-political-science-business-international-relations-and-the-political-economy	several thematic modules: business, production, and investment in the global economy. Each module includes video lectures and assignments.
2. International Macroeconomics (Edx)	URL: https://www.edx.org/learn/macroeconomics/the-university-of-queensland-international-macroeconomics	This course provides an introduction to international macroeconomics. It consists of several thematic modules: international economics, trade balances, and exchange rates. Each module includes video lectures and assignments.
3. International Business I (Coursera)	https://www.coursera.org/learn/international-business	This course provides an introduction to international business. It consists of several thematic modules: globalization, political and social institutions, gains from trade, and free trade. Each module includes video lectures and assignments.

Field of science 4. Mathematical, statistical and instrumental methods in economics

Online courses in English	Link	Course description
1. Algebra: From Elementary to Advanced level—Equations and Inequalities (Coursera)	URL: https://www.coursera.org/learn/algebra-i	This course provides an introduction to equations and inequalities. It consists of several thematic modules: computational methods, algebraic dependencies and their properties, and application of these concepts to model real-world situations. Each module includes video lectures, reading materials, and assignments.
2. Probability Theory, Statistics and Exploratory Data Analysis (Open Education)	URL:https://openedu.ru/course/hse/probability_theory_stat	This course provides an introduction to probability theory. It consists of several thematic modules: conditional probability and independence; random variables; systems of random variables; properties of expectation, variance, covariance, and correlation; continuous random variables; data summarization and descriptive statistics; and correlations and visualizations. Each module includes video lectures, reading materials, and assignments.
3. Probability Theory: The Foundation for Data Science (Coursera)	URL: https://www.coursera.org/learn/probability-theory-foundation-for-	This course provides an introduction to data science. It consists of several thematic modules: probability calculation, independent and dependent

	data-science	variables, and conditional events. Each module includes video lectures, reading materials, assignments, programming exercises, and laboratory work.

Field of science 5. Regional and sectoral economics

Online courses in English	Link	Course description
1. Local economic development (Coursera)	URL: https://www.coursera.org/learn/local-economic-development	This course provides an introduction to regional economics. It consists of several thematic modules: globalization and decentralization; entrepreneurship and innovation; and organization of local economies into clusters, value chains, and learning regions. Each module includes video lectures, reading materials and discussion prompts.
2. Business Strategies for Emerging Markets	URL: https://openedu.ru/course/hse/BUSSTREMMAR	This course offers an introduction to emerging markets. It consists of several thematic modules: generating a core business idea; choosing and supporting strategies; business tactics; and managing sales in emerging markets. Each module includes video lectures, reading materials, and assignments.
3. Developing innovative ideas for new companies: The first step in entrepreneurship (Coursera)	URL:https://www.coursera.org/learn/innovative-ideas	This course provides an introduction to entrepreneurship. It examines how to recognize business opportunities based on market conditions and industry factors. The course consists of several thematic modules: business opportunities; market conditions; industry factors. Each module includes video lectures, reading materials, and assignments.