ACADEMY OF TRANSPORT, INFORMATICS AND COMMUNICATIONS

V.M. GLUSHKOV INSTITUTE OF CYBERNETICS OF THE NATIONAL ACADEMY OF SCIENCE OF UKRAINE

MOLDOVA STATE UNIVERSITY

TARAS SHEVCHENKO NATIONAL UNIVERSITY OF KYIV

NORWEGIAN UNIVERSITY OF SCIENCE AND TECHNOLOGY

INTERNATIONAL INSTITUTE FOR APPLIED SYSTEMS ANALYSIS

SCHOOL PROGRAM

Norwegian-Moldavian-Georgian-Ukrainian School "Contemporary risk management" and "Optimization methods for motor vehicle transportation problems" (sponsored by SIU, grant CPEA-LT-2016/10003)

November 12–23, 2018

Chisinau, Moldova

Main Partners:
Norwegian University of Science and Technology (NTNU), Department of Industrial Economics and Technology Management, Trondheim, Norway
Project coordinator: Professor Alexei Gaivoronski

Taras Shevchenko National University of Kyiv (TSNUK), Faculty of Computer Science and Cybernetics, Kyiv, Ukraine
Project coordinator: Professor Volodymyr Zaslavskyi

Network Partners:
V.M. Glushkov Institute of Cybernetics (GIC, Kyiv, Ukraine) of the National Academy of Science of Ukraine (NASU)
Batumi Shota Rustaveli State University (BSU, Batumi, Georgia)
Ivane Javakhishvili Tbilisi State University (TSU, Tbilisi, Georgia)
Moldova State University (MSU, Chisinau, Moldova)
Academy of Transport, Informatics, and Communications (ATIC, Chisinau, Moldova)
Miratech Corporation Ukraine (MCU, Kyiv, Ukraine)
International Institute for Applied Systems Analysis (IIASA, Austria)
Systems Analysis Committee of NASU, Kyiv, Ukraine

Dear colleagues,

It is a great pleasure to welcome you to the School "Contemporary risk management" and “Optimization methods for motor vehicle transportation problems” organized as a part of the project “Advanced Collaborative Program for Research Based Education on Risk Management in Industry and Services under Global Economic, Technological and Environmental Changes” funded by the Norwegian Center for International Cooperation in Education (SIU).

The main objective of the project is to strengthen the Norwegian-Ukrainian-Eurasian educational and research cooperation in the field of Quantitative Risk Management and related topics, e.g. optimal decision

support under risk and uncertainty. The project seeks to develop a sustainable network of universities in Ukraine, Moldova, Georgia and Norway capable of designing and running joint programs and courses at both Master and PhD-levels. The cooperation will be based on principles of Bologna declaration and on combining strengths of each university in a particular field and creating synergies through the network cooperation

Participants will gain a deeper understanding of new challenges in the field of quantitative risk management and critical infrastructure protection. This school may be of particular interest to practitioners and policy-makers who prepare the guidelines for reforms in these areas. Beyond that, this school will serve as a networking platform to enhance education of young specialists in partner countries.

Project coordinator: Professor **Alexei Gaivoronski**

International Program Committee:

Chair: Professor Alexei Gaivoronski**,** Department of Industrial Economics and Technology Management, NTNU, Norway;

Co-Chair: Professor Volodymyr Zaslavskyi**,** Faculty of Computer Science and Cybernetics, TSNUK, Ukraine;

Co-Chair: Professor Dumitru Solomon, ATIC, Moldova;

Co-Chair: Professor Serghey Cataranciuc, Faculty of Mathematics and Computer Science, MSU, Moldova;

Co-Chair: Corresponding Member of NASU, Professor Pavlo Knopov, GIC, Ukraine.

Organizing Committee:

Alexei Gaivoronski; Dumitru Solomon; Serghey Cataranciuc;
Volodymyr Zaslavsky; Pavlo Knopov; Ibraim Didmanidze.

Local Organizing Committee:

Professor Serghey Cataranciuc, Professor Dmitrii Lozovanu, Asociate Professor Boris Hîncu, Asociate Professor Anatolie Godonoaga, Asociate Professor Valerii Ungureanu, Asociate Professor Alexandra Tkacenko.

Working languages of school are English, Moldavian, and Russian.

Contacts:

E-mail: atic@mtc.md Tel. +373 22 38 45 40, Fax +373 22 38 45 30
E-mail: s.cataranciuc@gmail.com , Tel. + 373 691 74 157

Day of Arrival

November 12, 2018, Moldova State University, Chisinau

First week 12 – 17 November 2018, audience 218, block 4

	Monday 12.11.2018	Tuesday 13.11.2018	Wednesday 14.11.2018	Thursday 15.11.2018	Friday 16.11.2018
10:00-12:00	Arrival	Conference	Conference	Laboratory class Stetsyuk	Laboratory class Hîncu
12:00-12:30	Arrival	Coffee-break	Coffee-break	Coffee-break	Coffee-break
12:30-13:00	Registration	Conference	Conference	Faculty Excursion	Faculty Excursion
13:00-14:30	Conference	Conference	Conference	Laboratory class Stetsyuk	Laboratory class Hîncu
14:30-15:00	Coffee-break	Coffee-break	Coffee-break	Coffee-break	Coffee-break
15:00-15:30	Conference	Opening	Faculty Excursion	Faculty Excursion	Faculty Excursion
15:30-16:15	Conference	Lecture 1 Knopov	Lecture 1 Gorbachuk	Lecture 1 Cataranciuc	Lecture 1 Stetsyuk
16:15-17:00	Conference	Lecture 2 Knopov	Lecture 2 Gorbachuk	Lecture 2 Cataranciuc	Lecture 2 Stetsyuk
17:15-18:00	Free time	Lecture 3 Zaslavskyi	Lecture 3 Stetsyuk	Lecture 3 Hîncu	Lecture 3 Vasyanin
18:00-18:45	Free time	Lecture 4 Zaslavskyi	Lecture 4 Stetsyuk	Lecture 4 Hîncu	Lecture 4 Vasyanin

Supplementary Lecture / Lecții suplimentare / Дополнительные лекции:
Saturday, November 17, 2018, audience 218, block 4

9^{00} – 9^{45} – Lecture 1, Didmanidze
9^{45} – 10^{30} – Lecture 2, Didmanidze
10^{45} – 11^{30} – Lecture 3, Purtukhia
11^{45} – 12^{30} – Lecture 4, Purtukhia

Second week 19 – 23 November 2018, audience 218, block 4

	Monday 19.11.2018	Tuesday 20.11.2018	Wednesday 21.11.2018	Thursday 22.11.2018	Friday 23.11.2018
10:00-12:00	Laboratory class Hîncu	Laboratory class Solomon	Laboratory class Solomon	Laboratory class Solomon	Laboratory class Ungureanu
12:00-12:30	Coffee-break	Coffee-break	Coffee-break	Coffee-break	Coffee-break
12:30-13:00	Faculty Excursion	Faculty Excursion	Faculty Excursion	Faculty Excursion	Faculty Excursion
13:00-14:30	Laboratory class Hîncu	Laboratory class Solomon	Laboratory class Solomon	Laboratory class Solomon	Laboratory class Ungureanu
14:30-15:00	Coffee-break	Coffee-break	Coffee-break	Coffee-break	Coffee-break
15:00-15:30	Faculty Excursion	Faculty Excursion	Faculty Excursion	Faculty Excursion	Faculty Excursion
15:30-16:15	Lecture 1 Solomon	Lecture 1 Solomon	Lecture 1 Solomon	Lecture 1 Godonoaga	Lecture 1 Mishkoy
16:15-17:00	Lecture 2 Solomon	Lecture 2 Solomon	Lecture 2 Solomon	Lecture 2 Godonoaga	Lecture 2 Mishkoy
17:15-18:00	Lecture 3 Solomon	Lecture 3 Tkacenko	Lecture 3 Solomon	Lecture 3 Ungureanu	Lecture 3 Lozovanu
18:00-18:45	Lecture 4 Solomon	Lecture 4 Tkacenko	Lecture 4 Solomon	Lecture 4 Ungureanu	Lecture 4 Lozovanu

Total participants: / Total participanții:/ Всего участников:

20 – lecturers / profesori / преподавателей

70 – students / studenți / студентов

36 – Lectures h / Lecții ore / Часов лекций

28 – Practical work h / Lucrări practice ore / Часов практических работ.

Total distribuited books: /Total distribuite cărți: / Всего распределенных книг:

320 - book copies, of which:/ exemplare de carte, din care:/ экземпляров книг, из которых:

40 – MMOTI – 2008, 2010, 2012,2016, 2014, 2018

30 – N.Z. Shor – 2008, 2009, 2012

50 – Solomon – 2010, 2012, Stetsyuk – 2014, 2018

30 – Solomon, Gamețchi – 2004, 2008 (OR – rus)

20 – Solomon, Gamețchi V. I, II – 2015 (OR – rom)

60 – Solomon, Gamețchii – 1996, 1997 (Mathematical modeling – rus)
40 – Solomon, Gamețchii – 1998 (Mathematical modeling – rom)
50 – Solomon – 2015 (Modeling, Optimization motor transport – 5 vol., rom)

Lecturers	
1. Cataranciuc Sergiu	11. Lozovanu Dmitrii
2. Didmanidze Ibraim	12. Mishkoy Gheorghe
3. Ermoliev Yuri	13. Purtuhia Omar
4. Ermolieva Tatiana	14. Solomon Dumitru
5. Gamețchi Andrei	15. Stetsyuk Petro
6. Gaivoronski Alexei	16. Tkacenko Alexandra
7. Godonoaga Anatol	17. Ungureanu Valeriu
8. Gorbachuk Vasyl	18. Vasyanin Vladimir
9. Hîncu Boris	19. Zaslavskyi Volodymyr
10. Knopov Pavlo	20. Yamkova Olga

Key lecturers

Sergiu Cataranciuc, Professor, PhD, Moldova State University:

Professor, Doctor Habilitat in Mathematics Sciences is the Head of Mathematic Department at the Faculty of Mathematics and Computer Science of Moldova State University. Also, Prof. Cataranciuc is the head of the Laboratory class "Mathematical Modeling and Optimization". He is the author of more than 150 scientific and methodical works, including 3 monographs and 7 textbook for students. His scientific works are in the field of Graph Theory and the development of mathematical models for social-economic processes, Operational Research, Convexity theory, Combinatorics, Cryptography, Discrete Optimization. He has participated in more than 20 scientific research projects. Mr. Cataranciuc is Laureate of the State Prize for Science and Technic of the Republic of Moldova.

Ibraim Didmanidze, Professor, DSc.:

Professor, Doctor of Physical and Mathematical Sciences, Head of the direction of Information Technologies of the Center of Languages and Information Technologies at the GE-Shota Rustaveli State University (Batumi, Georgia). He is a Member of the Engineering Academy of Georgia. He is the author of more than 170 scientific and methodical works, including two monographs, one Georgian patent, and a textbook book. His scientific works are in the field of Graph Theory and the development of mathematical models for technology processes. Leading specialist in ISTC project G- 725.

Yuri Ermoliev Professor, DSc.:

Professor, DSc. Ermoliev is a Member of the Ukrainian Academy of Sciences since 1988. Professor Y. Ermoliev has been the Head of the Department of Mathematical Methods of Operations Research at the Institute of Cybernetics of the Ukrainian Academy of Sciences, Kiev, since 1969. He was first employed with the International Institute for Applied Systems Analysis (IIASA, Laxenburg, Austria) in the System and Decision Sciences Program from 1979 to 1984, undertaking research in non-differentiable and stochastic optimization problems. In 1991 he was a visiting professor with the University of California at Davis. Currently, Professor Y.Ermoliev is the IIASA Institute Scholar contributing his research to the Advanced Systems Analysis Program at IIASA. Professor Ermoliev is a State Prize Winner in Science of Ukraine (1978) and the State Prize Winner in Science of the USSR (1981). He was awarded the Order of St. George the Victorious and medals of the National Academy of Sciences as a distinction for his extraordinary achievements in science. His long-term outstanding contribution has been recognized by the Mathematical Programming Society by the award of the "Pioneer in Stochastic Programming". Professor Ermoliev's scientific interests strongly follow the well-established tradition of the famous school of Ukrainian mathematicians in advancing the mathematics towards new challenging practical problems that could not be solved by existing methods. Working after the University at the Computing Center of the National Academy of Sciences, which later became the Glushkov Institute of Cybernetics, Ermoliev encountered in a vast variety of applications, requiring multidisciplinary approaches, new mathematics, models and methods. He was fascinated by fundamental challenges which must be confronted in advancing mathematician towards realistic applications to socio-economic and environmental problems. Professor Ermoliev's research focuses on modeling of decision-making processes in the presence of risks and uncertainties, stochastic and dynamic systems optimization, optimization on networks, and nonlinear dynamics. His major publications include Stochastic Programming Methods (1976), Stochastic Models in Economics (1979), and Techniques for Stochastic Optimization (1988). Other publications concern the study of path-dependent adaptation processes, pollution control problems, catastrophic management problems, energy and agriculture modeling, reliability theory, and optimization of discontinuous systems, in particular, discrete event systems optimization, which paths may be significantly affected by the occurrence of rare events.

Tatiana Ermolieva, PhD :

Tatiana Ermolieva is a Research Scholar with Ecosystems Services & Management Program (ESM) at the International Institute for Applied Systems Analysis (IIASA, Laxenburg, Austria). She holds the Kjell Gunnarson's Risk Management Prize (Swedish Insurance Society) and a IIASA Peccei Award for her work on optimal decisions for coping with dependent catastrophic risks. Tatiana Ermolieva has a master's degree in applied mathematics with specialization in statistics, optimization, and economics from Kyiv State University, Ukraine, and a PhD on spatio-temporal estimation and optimization of heterogeneous values and flows in complex dynamic and stochastic systems. Her main research interests are analysis and modeling of complex socioeconomic, agricultural, environmental, and financial systems with explicit treatment of uncertainties, risks, extreme events, and spatial and temporal heterogeneities of regions and agents. She develops quantitative models and methods, including software and practical applications, for designing strategies ensuring robust system performance in the presence of uncertainties and risks, in particular of extreme catastrophic nature. Tatiana Ermolieva's activities with ESM concern GIS-based modeling and optimization of regional developments, methodologies for robust downscaling of land use (including agricultural) values from incomplete, uncertain, aggregate information; non-parametric approaches to data estimation and recovering. Recent practical studies cover topics of global food security and adaptation under climatic uncertainties and risks; fusion of downscaling within the framework of ESM's GLOBIOM model; treatment of systemic risks with a stochastic version of GLOBIOM; design of robust insurance programs (including cat bonds, contingent credits, mutual funds) against climatic disasters, e.g., floods; analysis of robust economic instruments (emission trading markets) under uncertainties; and discounting under catastrophic risks. She applies her skills in several EU projects, in collaborative research with colleagues from various IIASA programs, joint research with IIASA NMOs and other institutions.

Alexei Gaivoronski, PhD, Professor, Norwegian University of Science and Technology (Norway):

Alexei Gaivoronski is Professor of Industrial Economics and Operations Research at the Department of Industrial Economics and Technology Management.

He is one of the leading international experts in methods of optimal decision support under uncertainty and in particular stochastic optimization,

risk management. His interests cover both theoretical and applied issues and particular applications in telecom, ICT economics, finance and investment. He published more than 70 research papers on these issues. Besides academic experience, he has extensive industrial experience where he worked in telecom industry and consulted for Hydro, Xerox, Telenor. He was the principal investigator in FP7 SPICE integrated project from NTNU where he led the team on evaluation of business models for provision of advanced mobile data services. He led the operations research group in IOT and obtained different industrial and academic grants. He is a participant in the international collaboration network on optimization under uncertainty and risk management, member of program committees of international conferences in stochastic programming and industrial optimization.

Anatol Godonoaga, PhD.: Professor of Department of Informatics and Information Management, Academy of Economics Study of Republic Moldova, Kishinev.

Education: the Faculty of Mathematics and Cybernetics (1978) of the Kishinev State University, Candidate of Science in Mathematics (1988). Anatol Godonoaga supervised 3 PhD students.

Research interests: 1. Linear and nonlinear programming; 2. Non-smooth optimization methods and its application; 3. Stochastic Programming; 4. Economic Processes Modeling. Publications: 100+ publications in refereed journals, 2 books.

Vasyl Gorbachuk, **DSc, Professor, Glushkov Institute of Cybernetics, National Academy of Sciences of Ukraine (Ukraine):**

Vasyl Gorbachuk DSc (Physics and Mathematics) in the field of Informatics and Cybernetics; Senior Research Associate, Department of Operations Research, V.M.Glushkov Cybernetics Institute (GIC), National Academy of Sciences of Ukraine; Professor, Chair of Finance, Department of Economic Sciences, National University of Kyiv Mohyla Academy (NaUKMA). Studied at Moscow Physical Technical Institute (Department of Management and Applied Mathematics) and Michigan State University (Department of Economics). Author of 7 books in Economics, Finance, Industrial Organization, Informatics, author of 400+ academic articles; editor of 2 books in Energy and Economics, editor of «Scientific Papers NaUKMA. Economics».

Boris Hîncu. State University of Moldova, Associate Professor.

Information of education: 1993 - Ph. D. in Mathematics and Physic, State University of Moldova, 1**983-1986** - Post Graduate studies in Mathematics and Physics, Computer Center of Academy of Sciences of URSS, **1975-1980 -** MS in Applied Mathematics, State University of Moldova, Faculty of Mathematics and Computer Science.

Research Interests. Optimization problems, multilevel optimization, scientific computing, theory of games (cooperative and non-cooperative, hierarchical games, combinatorial games, graph games) and mathematical methods of decision making, parallel programming and algorithms, administration of parallel clusters.

Teaching. Parallel programming and parallel algorithms **(2003- till present)**; Game theory and bargains problems **(2004-till present)**; Models of parallel programming, **(2004-till present)**; Multilevel optimization **(1996-2000)**; Game theory and application (**2001-2003)**; Informatics **(1996-2001).**
Total number of all publications is 85.

Pavlo Knopov, Professor, Corresponding Member of the National Academy of Sciences of Ukraine, Glushkov Institute of Cybernetics, National Academy of Sciences of Ukraine (Ukraine):

Affiliation and Official Address: Department of Mathematical Methods of Operation Research, V.M. Glushkov Institute of Cybernetics of National Academy of Science, Head of Department of "Mathematical Methods of Operation Research", Professor of Taras Shevchenko National University of Kyiv.

Education: Kyiv Taras Shevchenko National University, Mathematical Faculty, Ukraine; Master of Science Degree in Mathematics, PhD, Doctor of Science in Mathematics.

Awards: State Award of Ukraine in Science and Technology; V.M. Glushkov Award of National Academy of Science of Ukraine (1997). Pavel Knopov supervised 15 PhD students.

Research interests: 1. Problems of estimation of random processes and fields, 2. Control of random processes and fields, 3. Stochastic optimization problems. Publications: 200+ papers in refereed journals, 11 books.

Dr.Sc. Dmitrii Lozovanu

Scientific Degrees: Doctor of Physical and Mathematical Sciences, Kyiv State University, Ukraine, (1991); Candidate of Physical and Mathematical Sciences (PhD, 1980), Master of Sciences in Mathematics (1970).

Professional Career: Principal research worker of the Department of Mathematical Modelling, Head of the Department of Applied Mathematics, Principal research worker of the Department of Mathematical Modelling, Senior researcher, Researcher Institute of Mathematics and CS of Moldova Academy of Sciences;

Scientific Interests: Linear and nonlinear programming, Discrete and combinatorial optimization, Game and Control Theory, Stochastic Dynamic Programming

Teaching Experience: Linear and Nonlinear programming, Game Theory, Graph Theory, Stochastic Dynamic Programming; Linear Programming, Mathematical Modelling

Funded Research Projects: Modelling of stochastic dynamic systems and algorithms for solving Markov decision problems; Methods and algorithms for solving deterministic and stochastic optimization problems; Stochastic dynamic models and approaches for solving Markov decision problems; Numerical methods and algorithms for solving stochastic dynamic decision problems; Methods for solving optimization problems on networks with applications; Methods and algorithms for solving complex control problems; Decision support and algoritmic decision on a multilayered grid structure within the communication network CENETIX, Decision support and algoritmic decision on a multilayered grid structure within the communication network CENETIX.

Selected Publications: D.Lozovanu, S. Pickl. Optimization of Stochastic Discrete Systems and Control on Complex Networks. Springer, 2015 , 400 p; D.Lozovanu, S.Pickl. Optimization and Multiobjective Control of Time-Discrete Systems. Springer-Verlag, Berlin, 2009, 300 p.

Honors and Awards: National Prize of Moldova in Sciences (1998); Best Paper Award at the Symposium "Computing Systems, Discrete Models, Algorithm, Simulation, Information Systems, Networks", Annual National Award for the best mathematician of the country of Moldova (laureate of prize "Academician Sibirsky"); Moldovan Academy of Sciences Award.

Gheorghe Mishkoy, Academician of the Academy of Sciences of Moldova and Academician of the International Higher Education Academy of

Sciences, Professor of Free International University of Moldova, Principal Researcher of Institute of Mathematics and Computer Sciences of Moldova.

Education: State University of Moldova, post graduate curses at Lomonosov State University, Moscow. Candidate of Sciences in Mathematics (1974), Doctor of Sciences in Mathematics (1989).

Awards: Nicolae Milescu Spataru medal of the Academy of Sciences of Moldova (2017), The state award Medal of Labor Glory (2016), Dmitrii Cantemir medal of the Academy of Sciences of Moldova (2014), The state award Emeritus researcher (2009), Diploma of Excellence ULIM (2009), Award of the Academy of Sciences of Moldova for outstanding research (2008)**.**

Research interests: Probability and Statistics, Econometrics, Queuing Theory, Mathematical modeling, Operational research, Numerical methods. Publications: 250 + papers, 7 monographs and 4 textbooks.

Dumitru Solomon, Dr.Sc., prof. Academy of Transport, Informatics and Communications.

Scientific Degrees: Doctor of Technical Sciences, V.M. Glushkov Institute of Cybernetics (1992), Candidate of Physical and Mathematical Sciences (PhD), V.M. Glushkov Institute of Cybernetics (1985)

Professional Career: Rector of the Academy of Transport, Informatics and Communications. Moldova; Senior Researcher, Institute of Mathematics and Computer Science of Moldova Academy of Sciences; University Professor, Head of Department, The Academy of Economic Studies of Moldova; Research Assistant, Institute of Mathematics and Computer Science of Moldova Academy of Sciences;

Scientific Interests: Linear and nonlinear programming; Discrete and combinatorial optimization; Mathematical modeling and optimal planning and engineering industry and transport; Design and development of transport IT systems.

Teaching Experience: Linear and Nonlinear programming, Dynamic Programming, Informatics, Programming languages, Mathematical modeling, optimization and information systems in transport;

Selected Publications: 3 – monographs, 8 – books; 16 – training courses; 120+ scientific publications.

Honors and Awards: Moldovian Youth Prize in Science and Technology (1984); Academician of the International Academy of Informatization of the UN (1996); National Prize of Moldova in Sciences (1998).

Petro Stetsyuk, **DSc.:** Doctor of Physical and Mathematical Sciences, Department of Non-smooth Optimization Methods, V.M.Glushkov Institute of Cybernetics of National Academy of Science, Head of Department of "Non-smooth Optimization Methods", Professor of Kyiv Taras Shevchenko National University.

Education: the Faculty of Management and Applied Mathematics (1982) and graduate school (1992) of the Moscow Institute of Physics and Technology, Candidate of Science in Mathematics (1996) and Doctor of Science in Mathematics (2013).

Awards: the State Prize of Ukraine in the field of science and technology (2016), the Prize of Academician V.S. Mikhalevich of NAS of Ukraine (2017).

Research interests: 1. Linear and nonlinear programming; 2. Non-smooth optimization methods and its application; 3. The dual Lagrangian bounds in multi-extremal optimization problems. Publications: more than 150 scientific publications in refereed journals, 6 books, 8 sections in monographs, the author of the training courses "Non-smooth optimization methods and mathematical programming", "Convex optimization methods", "Optimization algorithms and network technologies", "Ellipsoid methods and r-algorithms".

Alexandra Tkacenko, Associate Professor, Ph.D:

Alexandra Tkacenko, Doctor in economics and mathematics is Associate Professor at the Department of Applied Mathematics, now Department of Mathematics of Moldova State University (MSU) since 2000 to present. Its teaching and research activity is focused on the fields: Operational Research, Multicriteria Modelling and Optimization of various types; Fractional Programming, Stochastic Programming, Fuzzy Modelling, Economic Efficiency and Productivity Models, Decision Theory, Portfolio Optimization and others. Being the author of nearly 100 scientific and didactic papers, she actively participates in various scientific events, especially international conferences, also in the various scientific research projects, she is scientific advisor to numerous undergraduate and master theses. Since 2006, she is the regional coordinator of Moldova's mathematical women in EWM (European Women Mathematicians).

Valeriu Ungureanu, Associate Professor, PhD, Moldova State University:

Valeriu Ungureanu is the Chair of Computer Science Department at the Faculty of Mathematics and Computer Science of Moldova State University. He is a doctor (of physical and mathematical sciences) in the field of Mathematical Cybernetics. He is the author of more than 120 scientific and methodological works, including the monograph "Pareto-Nash-Stackelberg Game and Control Theory" (2018), and three textbooks: "Mathematical Programming" (2001), "Operational Research" (2004) and "Web Animation" (2011). His scientific interests are in the fields of game theory, optimization methods, operational research and computer algebra systems. He is the Head of Wolfram Moldova Center, a representative office of Wolfram Research, Inc. in Moldova. He is a certified instructor in the domain of Wolfram Technologies.

Vladimir Vasyanin: Doctor of Technical Sciences, Senior Researcher, Leading Researcher at the Institute of Telecommunications and the Global Information Space of the National Academy of Sciences of Ukraine, Kyiv **Research interests:** mathematical models, methods, algorithms and programs for solving the discrete optimization problems on networks and graphs; mathematical modeling of complex systems with discrete flows and parameters; information technology in the management of complex systems.

Volodymyr Zaslavskyi, DSc (Technologies), Professor, Faculty of Computer Science and Cybernetics, Taras Shevchenko National University of Kyiv (Ukraine):

Volodymyr Zaslavskyi graduated from Kyiv Taras Shevchenko National University, Cybernetics Faculty, and continued his professional career within Alma Mater. He participated in numerous R&D projects related with optimization of complex systems reliability (satellites, rockets launching and communications complexes, etc.), Member of IIASA Society, from 1997 to 2012 he was the President of AFCEA Chapter in Ukraine. In 2007 he received DSc (Technologies) degree by speciality "System Analysis and Optimal Decisions Theory". Prof. V. Zaslavskyi promotes Type-Variety Principle to increase reliability of complex technical systems, he is the author of more than 180 scientific publications and 5 books. In 2011 he received Professorship. He has International Soros Science Education Program Award (1995), AFCEA Chairman's Superior Performance Award (1999), IBM Faculty Award (2004).

SCHOOL PROGRAM/ PROGRAMUL ȘCOLII /ПРОГРАММА ШКОЛЫ

Monday/ Luni/ Понедельник, 12.11.18

12^{00} – 12^{30} – Registration of the conference and school participants
Înregistrarea participanților la conferință și seminar
Регистрация участников конференции и школы

12^{30} – 13^{00} – Conference opening
Deschiderea conferinții
Открытие конференции

13^{00} – 17^{00} – Participation in plenary sessions of the conference
Participarea la ședințele plenare ale Conferinței
Участие в пленарных заседаниях конференции

Tuesday/ Marți/ Вторник, 13.11.18

10^{00} – 14^{30} – Participation in round table of the conference
Participarea la secțiile Conferinței
Участие в секционных заседаниях конференции

15^{00} – 15^{30} – School opening
Deschiderea școlii
Открытие школы

Participants / Participanți / Участники:

Professor Alexei Gaivoronski, Department of Industrial Economics and Technology Management (NTNU, Norway);
Professor Volodymyr Zaslavskyi, Faculty of Computer Science and Cybernetics (TSNUK, Ukraine);
Professor Dumitru Solomon, Academy of Transport, Informatics, and Communications (ATIC, Moldova)
Professor Serghey Cataranciuc, Faculty of Mathematics and Computer Science (MSU, Moldova).
Professor Ibraim Didmanidze, Faculty of Technologies, Center of Languages and Information Technologies (BSU, Georgea);
Professor Pavlo Knopov, Corresponding Member of the National Academy of Science of Ukraine (GIC, Ukraine).
Students, Aspirants, Faculty of Mathematics and Computer Science

LECTURES' PROGRAM /PROGRAMUL LECȚIILOR/ПРОГРАММА ЛЕКЦИЙ

Tuesday/ Marți/ Вторник, 13.11.18

Session 1 / Sesiunea 1 / Сессия 1

Stochastic Optimization Problems
Probleme de optimizare stocastică
Стохастические оптимизационные задачи

15^{30} – 16^{15} – Lecture 1, audience 218, block 4

Theme: Stochastic optimization problems and their applications
Tema: Probleme de optimizare stocastică și aplicațiile lor
Тема: Задачи стохастической оптимизации и их применения
Lecturers: Knopov P., Ermoliev Y., Ermolieva T.
Literature:

1. Ермольев Ю.М. Методы стохастического программирования-М.: Наука, 1976
2. Knopov P.S., Kasitskaya E.J.. Empirical estimates in stochastic optimization and identification. – Kluwer, 2002.
3. Ermoliev Yu.M., Knopov P.S. Method of empirical means in stochastic programming problems. – Cybern. Syst. Anal. 42, No. 6, 773-785 (2006)

16^{15} – 17^{00} – Lecture 2, audience 218, block 4

Theme: Solutions of problems with high risks
Tema: Soluționarea problemelor cu risc înalt
Тема: Решение задач с повышенным риском
Lecturers: Knopov P., Gaivoronski A., Norkin V.
Literature:

1. Голодніков О.Н., Кнопов П.С., Пепеляєв В.А.. Робастне оцінювання ризику. – Інститут кібернетики імені В.М.Глушкова НАНУ, Київ, 2008 р.
2. Chornei R.K., Daduna H. and Knopov P.S. Control of Spatially Structured Random Processes and Random Fields with Applications. – Springer, 2006.

3. Гайворонский А.А., Ермольев Ю.М., Кнопов П.С., Норкин В.И. Математическое моделирование распределенных катастрофических и террористических рисков. – Кибернетика и системный анализ. 2015. – Том 51. № 1. – С.97-110.

17^{15} – 18^{00} – Lecture 3, audience 218, block 4

Theme: Information Technology for Diversification and Optimization of Electricity Generation Structure of the Energy Companies

Tema: Tehnologii informaționale pentru diversificarea și optimizarea structurii de generare a energiei electrice de către companiile energetice

Тема: Информационные технологии для диверсификации и оптимизации структуры производства электроэнергии энергокомпаниями

Lecturers: Zaslavskyi V. , Pasichna M.

Literature:

1. Заславський В.А. Принцип різнотипності та особливості дослідження складних систем з високою ціною відмови / Заславський В.А.; Вісн. Київськ. ун-ту. – К: 2006.- №1, с. 136-147.
2. Заславський В.А. Застосування методу аналізу ієрархій при вирішенні проблеми диверсифікації складу портфеля джерел генерації електроенергії / В.А. Заславський, К.К. Красовська, М.В. Пасічна // Вісн. Київськ. ун-ту. Сер. фіз-мат. науки – К. 2016 - №2 – С. 82-89.
3. Zaslavskyi V. Type Variety Principle and the Algorithm of Strategic Planning of Diversified Portfolio of Electricity Generation Sources / V. Zaslavskyi, M. Pasichna // Advances in Intelligent Systems and Computing. Springer – 2017. – vol. 582. – P. 474-485. (SCOPUS).

18^{15} – 19^{00} – Lecture 4, audience 218, block 4

Theme: Problems of risk management and logistics tasks in beekeeping in a changing climate

Tema: Probleme de gestionare a riscurilor și de logistică în apicultură într-un climat în schimbare

Тема: Проблемы риск менеджмента и задачи логистики в пчеловодстве в условиях изменения климата

Lecturers: Zaslavskyi V., Yamkova O., Yailymova A.

Literature:

1. Neumann P. Honey bee colony losses / P. Neumann, N. L. Carreck // Journal of Apicultural Research. – 2010. – N. 49, Vol. 1. – p. 1-6. DOI: 10.3896/IBRA.1.49.1.01.
2. Fedoriak M.M. Winter losses of honey bee (Apis mellifera L.) colonies in Ukraine (monitoring results of 2015-2016) / M.M. Fedoriak, L.I. Tymochko, O.M. Kulmanov, R.A. Volkov, S.S. Rudenko // Ukrainian Journal of Ecology. – 2017. – N. 7, Vol. 4. – p. 604-613. DOI: 10.15421/2017_167.
3. Brown P. Winter 2016 honey bee colony losses in New Zealand / P. Brown, L. E Newstrom-Lloyd, B. J Foster, P. H Badger, J. A McLean // Journal of Apicultural Research. – 2018. – N. 57, Vol. 2. – p. 278-291.

Wednesday/ Miercuri/ Среда, 14.11.18

10^{00} – 14^{30} – Participation in round table of the conference
Participarea la secțiile Conferinței
Участие в секционных заседаниях конференции

Session 2/ Sesiunea 2 / Сессия 2

Stochastics' and Non-Differentiable Optimizations' Methods
Metode de optimizarea stocastică și nediferențiabilă
Методы стохастической и недифференцируемой оптимизации

15^{30} – 16^{15} – Lecture 1, audience 218, block 4
Theme: The values of perfect information and stochastic solution
Tema: Importanța soluțiilor stocastice și a informației perfecte
Тема: Значения совершенной информации и стохастического решения
Lecturers: Gorbachuk V., Yermoliev Y., Ermolieva T.
Literature:

1. Горбачук В.М., Дунаєвський М.С., Сулейманов С.-Б. Податкова конкуренція і кооперація за світові корпорації // Вісник Херсонського національного технічного університету. – 2018.– № 3 (66). Т.1. – С. 45–54.

2. Горбачук В.М., Макаренко О.С. Особливості прийняття рішень людиною для розв'язання складних міждисциплінарних проблем // Системні дослідження та інформаційні технології. – 2017. – № 3. – С. 73–87.
3. Горбачук В.М., Єрмольєв Ю.М., Єрмольєва Т.Ю. Двоетапна модель еколого-економічних рішень // Вісник Одеського національного університету. Економіка. – 2016. – Т. 21. – Вип. 9. – С. 142–147.

16^{15} – 17^{00} – Lecture 2, audience 218, block 4
Theme: Losses of aggregate efficiency under achieving interregional equity

Tema: Pierderea eficienței agregate la asigurarea echității interregionale

Тема: Потери агрегированной эффективности при достижении межрегионального равенства
Lecturers: Gorbachuk V., Gaivoronski A., Kirilyuk V.
Literature:
1. Горбачук В.М., Колесник Ю.С., Дунаєвський М.С. Втрати агрегованої ефективності при досягненні міжрегіональної рівності // Економіка та суспільство. – 2018. – Вип. 18. – С. 1077–1086.
2. Горбачук В.М., Дунаєвський М.С., Скороход Д.А. Моделювання фінансових криз // Інфраструктура ринку. – 2018. – Вип. 23. – С. 375–382.
3. Горбачук В.М., Шулінок Г.О., Сулейманов С.-Б. Моделювання взаємозв'язків на світовому ринку продовольства // Теорія оптимальних рішень. – 2018. – С. 99–106.

17^{15} – 18^{00} – Lecture 3, audience 218, block 4
Theme: Ellipsoid methods and r-algorithms
Tema: Metodele elipsoidelor și r-algoritmi
Тема: Методы эллипсоидов и r-алгоритмы
Lecturer: Stetsyuk P.
Literature:
1. Стецюк П.И. Методы эллипсоидов и r-алгоритмы. – Кишинэу, Эврика, 2014. – 488 с.
2. Шор Н.З. Методы минимизации недифференцируемых функций и их приложения. – Киев: Наукова думка, 1979.

3. Шор Н.З. Методы недифференцируемой оптимизации и сложные экстремальные задачи: сборник избранных трудов. – Кишинэу, Эврика, 2008.

18^{15} – 19^{00} – Lecture 4, audience 218, block 4
Theme: The dual bounds in the quadratic extremal problems
Tema: Estimațiile duale în problemele extemale pătratice
Тема: Двойственные оценки в квадратичных экстремальных задачах
Lecturer: Stetsyuk P.

Literature:
1. Стецюк П.И. Двойственные оценки в квадратичных экстремальных задачах. – Кишинэу, Эврика, 2018. – 504 с.
2. Шор Н.З., Стеценко С.И. Квадратичные экстремальные задачи и недифференцируемая оптимизация. – Киев: Наукова думка, 1989.
3. Шор Н.З. Методы минимизации негладких функций и матричные задачи оптимизации: сборник избранных трудов. – Кишинэу, Эврика, 2009.

Thursday/ Joi / Четверг, 15.11.18

10^{00} – 14^{30} – Practical work/ Lucrări practice / Практические работы

Theme: Subgradient methods with Polyak's step in original and transformed space of variables
Tema: Metode subgradient cu pasul Polyak în spațiul original și transformat al necunoscutelor
Тема: Субградиентные методы с шагом Поляка в исходном и преобразованном пространствах переменных
Lecturers: Stetsyuk P., Stovba Viktor, Zhmud Oleksandr
Literature:
1. Поляк Б.Т. Минимизация негладких функционалов // Журнал вычислительной математики и математической физики. – 1969, Т. 9, № 3. – С. 509–521.
2. Поляк Б.Т. Введение в оптимизацию. – М: Наука, 1983. – 384 с.
3. Стецюк П.И. Методы эллипсоидов и r-алгоритмы. – Кишинэу, Эврика, 2014. – 488 с.

Session 3 / Sesiunea 3 /Сессия 3
Combinatorics and Discrete Optimization
Combinatorica și optimizarea discretă
Комбинаторика и дискретная оптимизация

15^{30} – 16^{15} – Lecture 1, audience 218, block 4
Theme: Location problems on special classes of graphs
Tema: Probleme de amplasare pe clase speciale de grafuri
Тема: Задачи размещения на специальных классах графов
Lecturer: Cataranciuc S.
Literature:

1. Cataranciuc S., Sur N. Grafuri d-convex simple şi quasisimple. Monografie. Chişinău: CEP USM, 2009. 201 p.

16^{15} – 17^{00} – Lecture 2, audience 218, block 4
Theme: The complex of multi-ary relation and its applications
Tema: Complexe de relații multi-are și aplicații
Тема: Комплексы многомерных отношений и их приложения
Lecturer: Cataranciuc S.
Literature:

1. Cataranciuc S. Topologia algebrică a relațiilor multi-are. Chişinău: CEP USM, 2015. 228 p.
2. Bulat M., Cataranciuc S., Zgureanu A. Mulțimi de relații multi-are și criptarea informației. Monografie. Chişinău: CEP USM, 2013. 200 p.

17^{15} – 18^{00} – Lecture 3, audience 218, block 4
Theme: Information aspects in game theory
Tema: Aspecte informaționale în teoria jocurilor
Тема: Информационные аспекты в теории игр
Lecturer: Hîncu B.
Literature:

1. Herve Moulin. Theorie des jeux pour l'economic et la politique. Paris, 1981.
2. Boris Hancu, Nicolae Prodan, Ludmila Novac. Bazele teoriei jocurilor non-cooperatiste. Chisinau: CE USM, 2003.

3. Boris Hancu. Solving the games generated by the informational extended strategies of the players. Buletinul Academiei de Stiinte a Republicii Moldova. Matematica. Number 3(70), 2012, Pages 53-62.
4. Boris Hancu. Informational extended games generated by the one and double way directional informational flow. Studia Universitatis Moldaviae, seria Stiinte exacte si economice, nr. 7(47), Chisinau 2011. pp. 32-43

18^{15} – 19^{00} – Lecture 4, audience 218, block 4
Theme: Parallel programming on DMM and SMM systems
Tema: Programarea paralelă în sistemele DDM și SMM
Тема: Параллельное программирование в системах DDM и SMM
Lecturer: Hîncu B.
Literature:

1. MPI-2. Extension to the Message-Passing Interface: http://www.mpi-forum.org/docs/mpi20-html/
2. Г. И. Шпаковски, Н. В. Сериков Программирование для многопроцессорных системах в стандарте MPI, 2003
3. http://www.openmp.org
4. Boris Hîncu, Elena Calmîș. Modele de programare paralelă pe clustere. Partea I. Programare MPI. Note de curs. Chişinău. CEP USM, 2016. 129 pagini.

Friday/ Vineri / Пятница, 16.11.18

10^{00} – 14^{30} – Practical work / Lucrări practice / Практические работы
Theme: Parallel programming on DMM and SMM systems
Tema: Programarea paralelă în sistemele DDM și SMM
Тема: Параллельное программирование в системах DDM и SMM
Lecturer: Hîncu B.
Literature:

1. MPI-2. Extension to the Message-Passing Interface: http://www.mpi-forum.org/docs/mpi20-html/
2. Г. И. Шпаковски, Н. В. Сериков Программирование для много-процессорных системах в стандарте MPI, 2003
3. http://www.openmp.org

Session 4 / Sesiunea 4 / Сессия 4

Transportation Problems and Non-Smooth Optimization
Probleme de transport și optimizarea nediferențiabilă
Транспортные задачи и негладкая оптимизация

15^{30} – 16^{15} – Lecture 1, audience 218, block 4

Theme: Non-smooth optimization and its applications

Tema: Optimizarea nediferențiabilă și aplicații

Тема: Недифференцируемая оптимизация и ее применение

Lecturer: Stetsyuk P.

Literature:

1. Shor N.Z. Minimization method for non-differentiable functions. – Berlin: Springer-Verlag, 1985
2. Shor N.Z. Nondifferentiable optimization and polynomial problems. – Boston; Dordrecht; London: Kluwer Academic Publishers, 1998.

16^{15} – 17^{00} – Lecture 2, audience 218, block 4

Theme: Transportation problems and non-smooth optimization

Tema: Probleme de transport și optimizarea nediferențiabilă

Тема: Транспортные задачи и недифференцируемая оптимизация

Lecturer: Stetsyuk P.

Literature:

1. Михалевич В.С., Трубин В.А., Шор Н.З. Оптимизационные задачи производственно-транспортного планирования. Модели, методы, алгоритмы. – М.: Наука, 1986.
2. Шор Н.З., Соломон Д.И. Декомпозиционные методы в дробно-линейном программировании. – Кишинев: Штиинца, 1989
3. Шор Н.З. Алгоритмы последовательной и негладкой оптимизации: сборник избранных трудов. – Кишинэу, Эврика, 2012 – 270 с.

17^{15} – 18^{00} – Lecture 3, audience 218, block 4

Theme: The Problems of Flows Routing in Hierarchical Transport Networks. Part 1.

Tema: Probleme de dirijare a fluxurilor în rețele de transport ierarhice. Partea 1.

Тема: Проблемы маршрутизации потоков в иерархических транспортных сетях. Часть 1.

Lecturer: Vasyanin V.

18^{15} – 19^{00} – Lecture 4, audience 218, block 4

Theme: The Problems of Flows Routing in Hierarchical Transport Networks. Part 2.

Tema: Probleme de dirijare a fluxurilor în rețele de transport ierarhice. Partea 2.

Тема: Проблемы маршрутизации потоков в иерархических транспортных сетях. Часть 2.

Lecturer: Vasyanin V.

1. Задачи построения доставочных и сборочных маршрутов перевозки мелкопартионных грузов во внутренних зонах иерархической автотранспортной сети / В.А. Васянин, Л.П. Ушакова // Математичне моделювання в економіці. – 2016. – № 3–4. – С. 102–131.
2. Задачи построения комбинированных и раздельных маршрутов перевозки мелкопартионных грузов во внутренних зонах иерархической автотранспортной сети / В.А. Васянин // Математичне моделювання в економіці. – 2017. – № 1-2. – С. 74–92.
3. Васянин В.А. Задача распределения и маршрутизации транспортных блоков со смешанными вложениями и ее декомпозиция / В.А. Васянин // Проблемы управления и информатики. – 2015. – № 1. – С. 144–156. V.A. Vasyanin, “Problem of Distribution and Routing of Transport Blocks with Mixed Attachments and Its Decomposition,” Journal of Automation and Information Sciences, 47, No. 2, 56–69 (2015).

Saturday/ Sîmbătă / Суббота, 17.11.18

Session 5 / Sesiunea 5 / Сессия 5
Expectation and Stochastic Calculus
Speranța matematică și calculul stocastic
Математическое ожидание и стохастические исчисления

9^{00} – 9^{45} – Lecture 1, audience 218, block 4
Theme: Ecology and risk problems

Tema: Problemele riscuriloe ecologice

Тема: Проблемы экологических рисков

Lecturer: Didmanidze I.

9^{45} – 10^{30} – Lecture 2, audience 218, block 4
Theme: On artificial neural networks

Tema: Rețele neuronice artificiale
Тема: Искусственные нейронныесети и их применение
Lecturer: Didmanidze I.
Literature:

1. Didmanidze I.Sh., Kakhiani G.A., Didmanidze D.Z., Dumbadze Z. Strategies for learning artificial neural networks built on radial-base functions. XXVI Международная научная конференция студентов и молодых ученых, Наука и высшее образование. Запорожье. 15 ноября 2017. P.195-196.
2. Didmanidze, G. Kakhiani, Z. Dumbadze. The Issue Of Single-line Neural Networks Modeling As a Task Of Optimal Management. Вісник Київського Національного Університету імені Тараса Шевченка. Серія: Фізико-математичні науки. № 2, 2017, Украина, Киев 2017. p.63-66.
3. Didmanidze I., Kakhiani G., Dumbadze Z. On the Issue Of Choosing the Neuron Adaptive Educational Speed In the Last Hidden Layer Of a Neural Network. XXX international conference Problems of decision making under uncertainties (PDMU-2015). Abstracts. August 14-19, 2017, Vilnius, Lithuania. p. 41.

4. Didmanidze I., Kakhiani G., Didmanidze D. Modeling the time series dynamics with artificial neuron network. 13 th International Conference Theoretikal and applied aspect of program systems development. TAAPSD'2016. Proceeding. 5-6 December 2016 y. Kiev. p. 300-302.
5. Didmanidze I.Sh., Kakhiani G.A., Didmanidze D.Z. Neuron network modeling for finance data series Forecasting. XXVIII international conference Problems of decision making under uncertainties (PDMU-2016). Abstracts. August 25-30, 2016. Brno, Czech Republic. P. 37-38.

10^{45} – 11^{30} – Lecture 3, audience 218, block 4

Theme: Conditional mathematical expectation
Тема: Speranța matematică condiționată
Тема: Условное математическое ожидание
Lecturer: Purtukhia Omar
Literature:

1. Ширяев А. Н.. Вероятность – 1. – Москва, МЦНМО, 2004.
2. Castaneda L. B., Arunachalam V., Dharmaraja D.. Introduction to Probability and Stochastic Process with Applications. – John Wiley & Sons, 2012.
3. Purtukhia O. Theory of random processes. – Tbilisi, Tbilisi University Press (in Georgian), 2013.

11^{45} – 12^{30} – Lecture 4, audience 218, block 4
Theme: Elements of stochastic calculus
Тема: Elemente de calcul stocastic
Тема: Элементы стохастического исчисления
Lecturer: Purtukhia Omar
Literature:

1. Castaneda L. B., Arunachalam V., Dharmaraja D.. Introduction to Probability and Stochastic Process with Applications. John Wiley & Sons, 2012.
2. Karatzas I. and Shreve S. Brownian Motion and Stochastic calculus. – Springer, New York, 1991.
3. Purtukhia O. Theory of random processes. – Tbilisi, Tbilisi University Press (in Georgian), 2013.

Monday/ Luni/ Понедельник, 19.11.18

10^{00} – 14^{30} – Practical work / Lucrări practice / Практические работы

Theme: Parallel programming on DMM and SMM systems
Tema: Programarea paralelă în sistemele DDM și SMM
Тема: Параллельное программирование в системах DDM и SMM
Lecturer: Hîncu Boris

Session 6 / Sesiunea 6 / Сессия 6
Operations Research and Mathematical Modeling
Cercetări operaționale și modelare matematică
Исследования операций и математическое моделирование

15^{30} – 16^{15} – Lecture 1, audience 218, block 4

Theme: Operations Research. Static problems
Tema: Cercetări operaționale. Probleme statice
Тема: Исследования операций. Статические задачи
Lecturers: Solomon D., Gameţchi Andrei
Literature:

1. Гамецкий А.Ф., Соломон Д.И. Исследования операций. – Том. I. – Кишинэу, Эврика, 2004, – 500 с.
2. Gameţchi A., Solomon D. Cercetări operaționale. – Chişinău, Evrica, 2015, Vol. I. – 500 p.

16^{15} – 17^{00} – Lecture 2, audience 218, block 4

Theme: Operations Research. Dynamic and stochastic problems
Tema: Cercetări operaționale. Probleme dinamice și stocastice
Тема: Исследования операций. Динамические и стохастические задачи

Lecturers: Solomon D., Gameţchi Andrei

Literature:

1. Гамецкий А.Ф., Соломон Д.И. Исследования операций. – Том. II. – Кишинэу, Эврика, 2008 – 600 с.
2. Gameţchi A., Solomon D. Cercetări operaționale. – Chişinău, Evrica, 2015, Vol. II. – 608 p.

17^{15} – 18^{00} – Lecture 3, audience 218, block 4

Theme: Mathematical modeling of microeconomic processes

Tema: Modelarea matematică a proceselor microeconomice

Тема: Математическое моделирование микроэкономических процессов

Lecturers: Solomon D., Gameţchi Andrei

Literature:

1. Гамецкий А.Ф., Соломон Д.И. Математическое моделирование микроэкономических процессов. – Chişinău, Evrica, 1996.
2. Andrei Gameţchi, Dumitru Solomon. Modelarea matematică a proceselor economice. – Chişinău, Evrica, 1998.

18^{15} – 19^{00} – Lecture 4, audience 218, block 4

Theme: Mathematical modeling of macroeconomic processes

Tema: Modelarea matematică a proceselor macroeconomice

Тема: Математическое моделирование макроэкономических процессов

Lecturers: Solomon D., Gameţchi Andrei

Literature:

1. Гамецкий А.Ф., Соломон Д.И. Математическое моделирование микроэкономических процессов. – Chişinău, Evrica, 1996.
2. Andrei Gameţchi, Dumitru Solomon. Modelarea matematică a proceselor economice. – Chişinău, Evrica, 1998.

Tuesday/ Marți/ Вторник, 20.11.18

10^{00} – 14^{30} – Practical work / Lucrări practice / Практические работы

Theme: Solving of operations research problems (QM system)

Tema: Rezolvarea problemelor de cercetări operaționale (Sistema QM)

Тема: Решение задач исследования операций (Система QM)
Lecturer: Solomon D.

Session 7 / Sesiunea 7 /Сессия 7
Fractional programming problems
Probleme de programare fracționară
Задачи дробного программирования

15^{30} – 16^{15} – Lecture 1, audience 218, block 4

Theme: Fractional-convex programming and non-differentiable optimization

Tema: Probleme fracționar-convexe și optimizarea nediferențiabilă

Тема: Дробно-выпуклое программирование и недифференцируемая оптимизация.

Lecturer: Solomon D.

Literature:

1. Шор Н.З., Соломон Д.И. Декомпозиционные методы в дробно-линейном программировании. – Кишинев: Штиинца, 1989.
2. Лозовану Д.Д., Соломон Д.И. Нелинейные оптимизационные задачи. Алгоритмы и сложности. – Chişinău, Evrica, 1996.
3. Соломон Д.И. Дробное программирование и недифференцируемая оптимизация. – Кишинэу, Эврика, 2010. – 554 с.

16^{15} – 17^{00} – Lecture 2, audience 218, block 4

Theme: Generalized fractional-convex problems and non-differentiable optimization

Tema: Probleme generalizate fracționar-convexe și optimizarea nediferențiabilă

Тема: Обобщенные дробно-выпуклые задачи и недифференцируемая оптимизация

Lecturer: Solomon D.

Literature:

1. Соломон Д.И. Дробное программирование и недифференцируемая оптимизация. – Кишинэу, Эврика, 2010. – 554 с.
2. Соломон Д.И. Субградиентные методы решения задач обобщенного дробного программирования. – Кишинэу, Эврика, 2012. – 88 с.

17^{15} – 18^{00} – Lecture 3, audience 218, block 4

Theme: The fractional transportation problems

Тема: Probleme de transport fracționare

Тема: Дробные транспортные задачи

Lecturer: Solomon D.

Literature:

1. Шор Н.З., Соломон Д.И. Декомпозиционные методы в дробно-линейном программировании. – Кишинев: Штиинца, 1989
2. Соломон Д.И. Дробное программирование и недифференцируемая оптимизация. – Кишинэу, Эврика, 2010. – 554 с.
3. Stancu-Minasian I.M. Metode de rezolvare a problemelor de programare fracționară. – Editura Academiei Române, Bucureşti, 1992.
4. Stancu-Minasian I.M. Fractional Programming: Theory, Methods and Applications. – Kluwer Academic Publishers, Boston, 1997

18^{15} – 19^{00} – Lecture 4, audience 218, block 4

Theme: Multicriterial fractional transportation problems

Тема: Probleme multicriteriale fracționare de transport

Тема: Многокритериальные дробные транспортные задачи

Lecturer: Tkacenko A.

Literature:

1. Stancu-Minasian I.M. Metode de rezolvare a problemelor de programare fracționară. – Editura Academiei Române, Bucureşti, 1992.
2. Stancu-Minasian I.M. Fractional Programming: Theory, Methods and Applications. – Kluwer Academic Publishers, Boston, 1997
3. Соломон Д.И. Дробное программирование и недифференцируемая оптимизация. – Кишинэу, Эврика, 2010. – 554 с.
4. Соломон Д.И. Субградиентные методы решения задач обобщенного дробного программирования. – Кишинэу, Эврика, 2012.

Wednesday/ Miercuri/ Среда, 21.11.18
10^{00} – 14^{30} – Practical work/ Lucrări practice / Практические работы
Theme: Solution of fractional programming problems (QM system)
Тема: Rezolvarea problemelor de programare fracționară (Sistema QM)
Тема: Решение задач дробного программирования (Система QM)
Lecturer: Solomon D.

Section 8 / Sesiunea 8 / Сессия 8
Modeling, Optimization and Planning for motor transport
Modelare, optimizare şi planificare în transportul auto
Моделирование, оптимизация и планирование на автотранспорте

15^{30} – 16^{15} – Lecture 1, audience 218, block 4

Theme: Mathematical modeling of transport networks
Тема: Modelarea matematică a rețelelor de transport
Тема: Математическое моделирование транспортных сетей

Lecturer: Solomon D.

16^{15} – 17^{00} – Lecture 2, audience 218, block 4
Theme: Determination of optimal road freight transport plans

Тема: Determinarea planurilor optime de transportare rutieră a mărfurilor

Тема: Определение оптимальных планов грузовых автомобильных перевозок

Lecturer: Solomon D.

17^{15} – 18^{00} – Lecture 3, audience 218, block 4

Theme: Finding of the multy-link ring road of the freight routes
Тема: Determinarea rutelor inelare cu mai multe linii de transportare rutieră a mărfurilor
Тема: Определение многозвенных кольцевых маршрутов грузовых автомобильных перевозок

Lecturer: Solomon D.

18^{15} – 19^{00} – Lecture 4, audience 218, block 4
Theme: Finding of the two-link ring road of the freight routes

Тема: Determinarea rutelor inelare cu două linii de transportare interurbană a mărfurilor

Тема: Определение двухзвенных кольцевых маршрутов грузовых автомобильных перевозок

Lecturer: Solomon D.

Literature:

Solomon Dumitru. Modelare, optimizare şi planificare în transportul auto. (curs universitar editat în 5 cărți):

1. Cartea I-a. Modelarea maTematică a rețelelor de transport rutier. – Chişinău: Evrica, 2015. – 70 p.
2. Cartea a II-a. Determinarea planurilor optime de transportare rutieră de marfă. – Chişinău: Evrica, 2015. – 80 p.
3. Cartea a III-a. Metoda planurilor suprapuse de determinare a rutelor inelare cu mai multe linii de transportare. – Chişinău: Evrica, 2015. - 164 p.
4. Cartea a IV-a. Metoda selectivă de determinare a rutelor inelare cu două linii de transportare interurbană. – Chişinău: Evrica, 2015. – 160 p.
5. Cartea a V-a. Metoda directă de determinare a rutelor inelare cu două linii de transportare interurbană. – Chişinău: Evrica, 2015. – 192 p.

Thursday/ Joi/ Четверг, 22.11.18
10^{00} – 14^{30} – Practical work/ Lucrări practice / Практические работы

Theme: The solving of the problems of modeling, optimization and planning for motor transport (QM System)

Tema: Rezolvarea problemelor de modelare, optimizare şi planificare în transportul auto (Sistema QM)

Тема: Решение задач моделирования, оптимизации и планирования на автотранспорте (Система QM)

Lecturer: Solomon D.

Section 9 / Sesiunea 9 / Сессия 9

Optimizarea stocastică nediferențiabilă și jocuri stocastice
Стохастическая недифференцируемая оптимизация и стохастические игры

15^{30} – 16^{15} – Lecture 1, audience 218, block 4
Theme: Minmax problems and stochastic algorithms
Tema: Probleme de minimax și algoritmi stocastici
Тема: Задачи минимакса и стохастические алгоритмы
Lecturer: Godonoagă A.

16^{15} – 17^{00} – Lecture 2, audience 218, block 4
Theme: Stochastic transportation problems
Tema: Probleme ctocastice de transport
Тема: Стохастические транспортные задачи
Lecturer: Godonoagă A.
Literature:

1. Godonoagă A., Baractari A. Modele economice nediferenţia-bile. Aspecte decizionale. Chișinău: Editura ASEM, 2011. 275 p.
2. Gametchi,A. Godonoagă, A. Toacă, Z. Cercetări operaționale. Chișinău: Editura ASEM, 2015. 280 p. , 15,0 c.a.

17^{15} – 18^{00} – Lecture 3, audience 218, block 4
Theme: Pareto-Nash-Stackelberg game and control theory
Tema: Jocuri și control de tipul Pareto-Nash-Stackelberg
Тема: Игры и управление Парето-Нэш-Штакелберга
Lecturer: Ungureanu V.
Literature:

1. Valeriu Ungureanu, Pareto-Nash-Stackelberg Game and Control Theory, Springer International Publishing, 2018, XXI+343 pp.
2. Maria Sagaidac, Valeriu Ungureanu, Cercetări Operaționale, Chișinău, CEP USM, 2004, 297 pp.

18^{15} – 19^{00} – Lecture 4, audience 218, block 4
Theme: Modern computer algebra systems
Tema: Sisteme moderne de algebră computațională
Тема: Современные системы компьютерной алгебры

Lecturer: Ungureanu V.
Literature:

1. Stephen Wolfram, An Elementary Introduction to the Wolfram Language, Second Edition, Wolfram Media, Inc., 2017, 339 pp.

Friday / Vineri/ Пятница 23.11.18
10^{00} – 14^{30} – Practical work/ Lucrări practice / Практические работы
Theme: Modern computer algebra systems
Tema: Sisteme moderne de algebră computațională
Тема: Современные системы компьютерной алгебры
Lecturer: Ungureanu V.

Section 10 / Sesiunea 10 / Сессия 10
Optimization of stochastic discrete systems
Optimizarea în sisteme stocastice discrete
Оптимизация в дискретных стохастических системах

15^{30} – 16^{15} – Lecture 1, audience 218, block 4
Theme: Introduction in Queueing Theory
Tema: Introducere în teoria de așteptare
Тема: Введение в теорию массового обслуживания
Lecturer: Mishkoy Gh.
Literature:

1. Гнеденко Б.В., Коваленко И.Н. Введение в теорию массового обслуживания. – Москва, 2005 г.
2. Мишкой Георгий. Обобщенные приоритетные системы. Кишинев, Штиинца, 2009, 216 с.

16^{15} – 17^{00} – Lecture 2, audience 218, block 4
Theme: Polling models with semi- Markov Switching
Tema: Modele de votare cu comutare semi-Markov
Тема: Модели опроса с полумарковским переключением
Lecturer: Mishkoy Gh.
Literature:

1. Gh. Mishkoy. Priority Systems with Orientation. Analytical and Numerical Results. Springer, Germany, 2017, p.109- 120.

2. Gheorghe Mishkoy, Diana Bejenari, Lilia Mitev, Ionela Ticu. Numerical solutions of Kendall and Pollaczek-Khintchin equations for exhaustive polling systems with semi-Markov delays. Computer Science Journal of Moldova, V.24, N.2(71), 2016, p. 255-272.
3. Gh. Mishkoy. Generalized Priority Systems. Analytical Results and Numerical Algorithms. Serdica Journal of Computing, Bulgaria, v.8, n.3, 2015, p.281-290.
4. Gh. Mishkoy, L. Mitev. Performance characteristics for DD priority discipline with semi-Markov switching. Communications in Computer and Information Science (CCIS) Series, Springer International Publishing, Germany, 2014, p. 204-218.

17^{15} – 18^{00} – Lecture 3, audience 218, block 4
Theme: Optimization of discret systems

Tema: Optimizarea în sisteme discrete

Тема: Оптимизация в дискретных системах

Lecturer: Lozovanu D.

18^{15} – 19^{00} – Lecture 4, audience 218, block 4
Theme: Optimization of stochastic discrete systems

Tema: Optimizarea în sisteme stocastice discrete

Тема: Оптимизация в дискретных стохастических системах

Lecturer: Lozovanu D.
Literature:

1. Лозовану Д.Д., Соломон Д.И. Нелинейные оптимизационные задачи. Алгоритмы и сложности. – Chișinău, Evrica, 1996.
2. Lozovanu D., Pickl S. Optimization and Multiobjictive Control of Time-Discret Systems. – Springer, Berlin, 2009. –
3. Lozovanu D., Pickl S. Optimization of Stochastic Discrete Systems and Control on Complex Networks. – Springer, Berlin, 2015 – 400 p.
4. Lozoovanu D., Lazari A., Capcelea M. Sisteme dinamice, deterministe și stochastiice. Evoluție, optimizare și control optimal discret. – Chișinău, CEP USM, 2015.

List of participants Students & Aspirants:

1. Andreiciuc Alexandra	**36. Iarovoi Andrei**
2. Artiomov Evghenii	**37. Iovva Natalia**
3. Babuș Anastasia	**38. Jurakovskii Cristina**
4. Baibarac Iulia	**39. Lazarescu Profira**
5. Baklașanskaia Ecaterina	**40. Lifter Elisaveta - Valeria**
6. Berghii Elena	**41. Lucaș Alexei**
7. Botnari Alexandr	**42. Marchin Anton**
8. Bragoi Marcel	**43. Mardari Alexandr**
9. Brumă Corina	**44. Matiescu Gheorghe**
10. Burlescu Sergiu	**45. Meagkoi Ivan**
11. Butucel Andrei	**46. Melniciuc Nichita**
12. Cataranciuc Emil	**47. Mociu Alexandra**
13. Cerven Alexandra	**48. Nani Alexandru**
14. Cetulean Sergiu	**49. Navroțkaia Ilona**
15. Comar Vladislav	**50. Negaliuc Maxim**
16. Diomin Evghenii	**51. Onișoru Cristina**
17. Dones Vadim	**52. Petras Roman**
18. Dubceac Nina	**53. Pînzaru Gheorghe**
19. Gîlca Nichita	**54. Pîrlog Alexandru**
20. Gogu Ludmila	**55. Poluhina Marina**
21. Gorbatin Maxim	**56. Prijilevskaia Olga**
22. Gorea Sorin	**57. Reabțev Alina**
23. Grimaliuc Denis	**58. Segnitova Anna**
24. Grinevici Alexandr	**59. Serdiuc Maxim**
25. Grubleac Anastasia	**60. Stovba Victor**
26. Grubleac Nicolae	**61. Șamota Vasilii**
27. Grubneae Nadejda	**62. Timotina Natalia**
28. Hlistal Veaceslav	**63. Tkacenko Ivan**
29. Corlăteanu Alexandru	**64. Tobultoc Mariana**
30. Corobco Vladimir	**65. Topalo Alexandr**
31. Curcubet Sanda	**66. Tverdohleb Maxim**
32. Curtev Dmitrii	**67. Volos Alexandra**
33. Cuznețov Elena	**68. Zhmud Alexandr**
34. Danilov Pavel	**69. Zmeu Olimpiada**
35. Delimuhametov Teimu	**70. Yailimova Anna**