Pedagogic case and specific course in which designed tasks and units are used

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Pedagogic case:	• Modeling of systems and processes for analogical, numerical, and imitational methods. • The course is intended for undergraduate students in the field of computer science.
Description (including temporal scheme for design, development and implementation)	• Mathematical modeling is the application of adequate models of the systems that are being researched for solving problems of analysis and synthesis using analytical and simulation methods. • In the process of modeling, the tasks of developing a model, analyzing properties and making recommendations for the modernization of existing or designing a new system using IBL are being solved. • Design and development February-May 2019, implementation from September 2019.
m of pedagogic case	• to reveal the connections of abstract mathematical concepts with reality, the transition from a formal mathematical problem to its interpretation • to present the visibility of mathematical methods.
Mathematical concepts	• Mathematical modeling • Probability • Kolmogorov's equation
Addressed practice	• Master's course on Computer Science. First semester
Place in specific course Course name Place of units	• Course of Modeling Systems and Processes • One semester • Lectures and laboratory works
Learners profile orientation, year, age, prior knowledge, other such as math anxiety, special needs, ..	• The first year of the Master's program "Computer Science" • Necessary knowledge: Higher Mathematics, Discrete Mathematics, Probability Theory and Mathematical Statistics, Programming • Visualizability of mathematical tools
Organisation of specific course study credits/hours, location, group size	• 5 credits ECTS course • 40 classroom hours (8 hours of lectures, 24 hourslaboratory work, 8 hours of module control, 80 hours of unaided work) • 4 hours every week , during 10 weeks • 12 persons

Expected learning outcomes	• Students have the opportunity to simulate and explore simple, but real systems with different parameters.
Envisioned use of digital technology	• Mathcad,Wolfram, AnyLogic, GPSS World

Planning of tasks	• Analysis of mathematical preparation for studying the course
	• Problem definition that requires integrated knowledge and research to find its solution;
	• Requests from a teacher, inquiries from students
	  ○ practical, theoretical, cognitive significance of the expected results;
	• Formalization of the model by known ways of formal representation
	• Structuring the content with phased results;
	• Independent student activity
	  ○ Model implementation.
	  ○ Model research
	• Summarizing, adjustment
	• Conclusions, based on results obtained in the process of modeling

Names of persons involved	• Iryna Mashkina
Course:	Modeling of systems and processes Master Course in Computer Science
Learning objectives	• Concepts and principles of a model approach to social reality • Ability to apply modern mathematical tools for solving tasks of modeling • construction of mathematical and computer model of the research process; • processing modeling results
Learning contents	• model- algorythm-program • simulation modeling • mass service system • computer model implementation
teaching /learning activities	• Lectures, laboratory works in computer laboratories, group discussions of problem issues.
Media	• e-learning course, computer laboratories, including on-line, software
Evaluation	• The correctness of constructing a mathematical model

	• Completeness of computer realization • Research and modification of the model
Instructor role	• Content development of the course (presentations, tasks for laboratory works) • Presentation of basic ideas, formulation of the problem • Individual consultations for students on questions that arise • Monitoring of students' achievements
Student roles	• Submission of hypotheses, formulation of questions, tasks executions, self-examinations, mutual evaluations.