(Ф 03.02 – 91)

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

National Aviation University

Faculty of Economics and Business Administration

Logistics Department

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|  | APPROVED  Acting Rector  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ «\_\_\_»\_\_\_\_\_\_\_\_\_\_\_\_2018 |



Quality management system

**SYLLABUS**

**on**

**«Systems Approach in Logistics»**

Field of study: 07 «Management and Administration»

Speciality: 073 «Management»

Specialization: «Logistics»

Year of study – 2 Semester – 4

Classroom Sessions – 51 Graded Test – 4 semester

Self-study – 39

Total (hours/credits ECTS) – 90/3

Index CB-6-073 / 16 – 3.13

**QMS NAU S 11.02.04-01-2018**

The Syllabus on “Systems Approach in Logistics” is based on the educational and professional program and Bachelor Curriculum № CB - 6 - 073 / 16 for Speciality 073 «Management», Specialization «Logistics» and correspondent normative documents.

The Syllabus was developed by:

Associate Professor

of the Logistics Department А. Donets

Senior Lecturer

of the Logistics Department О.Маtiychyk

Discussed and approved by the Graduate Department for Speciality 073 «Management», Specialization «Logistics» – Logistics Department, Minutes № \_\_ of \_\_\_\_\_\_\_\_.2018.

Head of the Department \_\_\_\_\_\_\_\_\_\_\_\_\_ M. Grygorak

Discussed and approved by the Scientific-Methodological-Editorial Board of the Faculty of Economics and Business Administration, Minutes №\_\_of “\_\_\_\_\_” 2018.

Head of the SMEB \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A. Tofanchuk

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| “Agreed” |  |
| Acting Dean of the Faculty of  Economics and Business Administration  \_\_\_\_\_\_\_\_\_\_\_\_ S. Petrovska | Director of the Center  of Advanced Technologies  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ V. Kazak |
| "\_\_\_\_\_"\_\_\_\_\_\_\_\_\_\_2018. | "\_\_\_\_\_"\_\_\_\_\_\_\_\_\_\_2018. |

Level of document – 3b

Planned term between revisions – 1 year

**Registered copy**

1. **EXPLANATORY NOTES**

The syllabus of the course “Systems Approach in Logistics” was developed on the basis of "The guidelines for the development and execution of Syllabus and Course Training Program", enacted by decree 16.06.2015 №37/роз.

The given course serves theoretical background for the total knowledge and skills that form the professional profile in the sphere of logistics.

The goal of the course “Systems Approach in Logistics” is formation of fundamental knowledge of systems theory and systems analysis for students as the methodological basis for logistics, mastering the systems thinking, forming skills of practical application of systems theory and methods of systems analysis in design and arrangement of logistics processes and in management of logistics systems of various levels.

Objectives of studying the course are:

* formation of fundamental knowledge of systems theory and systems analysis for students as the methodological basis for logistics;
* mastering the systems thinking;
* forming skills of practical application of systems theory and methods of systems analysis in design and arrangement of logistics processes and in management of logistics systems of various levels.

As a result of this subject mastering a student should:

**know:**

* general systems theory;
* theory of modeling systems;
* general principles of systems management and optimization of their parameters;
* methodology of systems approach;
* methods of systems analysis;
* procedures of implementing systems analysis;
* principles of arrangement and management of logistics systems.

**be able to do**:

* independently group and define the borders of the system;
* independently develop the system’s structure;
* independently calculate the parameters of functioning and development of systems;
* independently develop and investigate models of systems;
* independently carry out systems analysis of economic phenomena, processes and objects;
* independently perform systems analysis of logistics systems.

Training material is structured according to a module principle and consists of two educational modules:

* training **module №1 «Systems approach as basis of managerial activity»**;
* training **module №2 «Systems Analysis in Logistics»**, each of which is logically complete, relatively independent, integral part of the discipline, learning which provides for carrying out module control and analyze the results of its implementation.

Knowledge and skills obtained by the student during mastering of the academic course will be used in the further study of various courses of professional training with basic and complete higher education, such as «Transport Logistics», «Logistics Engineering», «Logistics Activity Planning», «Logistics Project Management», etc.

**2. SUBJECT CONTENT**

**2.1. Module №1 «Systems approach as basis of managerial activity»**

Тopic 2.1.1. Subject, methods and objectives of the course.

Systematicity as a general property. Role of systems thinking in practical activity. Instruments of thinking. Connection between systems thinking and systems analysis. Types of systems activity. Essence of systems approach in economics. Logistics as a systems notion in economics. Role of systems thinking in training of management and logistics professionals.

Тopic 2.1.2. Concept of system and logistics system.

Definition of system. Basic notions of systems. Properties, peculiarities and features of systems. Components of systems. Definition of logistics system. Flexibility (adaptability) of a system. Common systems properties.

Тopic 2.1.3. Composition of system. Structure logistics systems.

Composition of system: definition of subsystem, element of system. Form, wholeness and structure of system. Decomposition of system, systems structuring. Classification of systems by structure. Typical structure of logistics system of enterprise. Subjects and objects of logistics systems.

Тopic 2.1.4. Classification of systems and relationships within systems.

Criteria for classifying systems and classes of systems. Determined and stochastic systems. Mutlitargeted systems. Scale and complexity of system. Role of connections, their types and functions. Reverse connections. Systems of organizational management. Comparison of social-economic and engineering systems. Decision-support systems for managerial solutions. Enterprise as an open complex system social-economic system. Classification of logistics systems.

**2.2. Module №2 «Systems Analysis in Logistics»**

Тopic 2.2.1. Modelling of logistics systems.

Models of systems. Research of models. Adequacy of models. Isomorphism and homomorphism of models. Classification of models. Stages of systems modeling. Computer simulation modeling. Formal and systems approach to structuring of problems. Modeling of logistics systems. Analytical and simulation models in logistics. Prognostic models in logistics.

Тopic 2.2.2. Information in systems analysis.

Concept of information. Classification of information by properties. Systems entropy. Information as a management resource. Informational aspects of logistics. Informational support of logistics systems. Development of informational technologies in logistics.

Тopic 2.2.3. Behaviour and development of systems. Systems management. State, behavior and development of systems. Interaction with environment. Functions of systems. Functioning of systems. Management of systems. Quality of management. Potential of system. System optimality. Decision-making in management of systems. Typical managerial decisions in logistics systems. Stability and safety of systems. Synergetic approach to logistics. Logistics system from the point of view of cybernetics. Conditions to stability of systems. General principles of efficiency assessment of logistics systems.

Тopic 2.2.4. Procedures and methods of systems analysis.

Content of systems analysis for a particular industry. Stages of systems analysis. Methods of systems analysis. Qualitative methods. Quantitative methods. Brainstorming method. Method of objectives tree. Method of scenarios. Experts methods.

Тopic 2.2.5. Analysis and synthesis of logistics systems.

Logistics objectives. Functions of logistics systems. Formalization of logistics systems on the theoretical and multinomial level. Classification and structuring of logistics systems. Criteria of logistics systems’ quality. Economic and informational support of logistics systems. Systems logistics analysis.

**3. LIST OF REFERENCES**

**3.1. The basic literature**

* + 1. Вдовин В. М., Суркова Л. Е., Валентинов В. А. Теория систем и системный анализ: учебник. Издательско-торговая корпорация «Дашков и К». – 2016. – 644 с.
    2. Сурмин Ю. П. Теория систем и системный анализ: Учеб. пособие. — К.: МАУП, 2003. — 368 с.: Библиогр. в конце глав.
    3. Федулов Ю. Г., Юсов А. Б. Теория систем: монографія. Директ-Медиа. – 2015. – 366 с.
    4. Jackson, M. Systems Thinking: Creative Holism for Managers, Chichester: John Wiley & Sons, Ltd. – 2003.
    5. Lin, Y. General Systems Theory: A Mathematical Approach. Springer Science & Business Media. – 2006. – 382 p.
    6. Meadows, D.H. Thinking in Systems: A Primer, Chelsea Green Publishing. – 2008.
    7. Miller, J.H., and Page, S.E. Complex Adaptive Systems. An Introduction to Computational Models of Social Life. Princeton: Princeton U.P. – 2007.
    8. Sterman, J. Business Dynamics: Systems thinking and modeling for a complex world. Boston: McGraw Hill. – 2010.
    9. Weinberg, G.M. An Introduction to General Systems Thinking. Dorset House Publishing Company, Incorporated; 25 Anv edition, April. 2011.

**3.2. The additional literature**

* + 1. Ременников В.Б. Разработка управленческого решения. Учеб. Пособие. – М.: ЮНИТИ-ДАНА. – 2000.
    2. Christopher, W.F. Holistic Management: Managing What Matters for Company Success. Hoboken: Wiley Interscience. – 2007.
    3. Mele, C., Polese, F. Key dimensions of Service Systems: Interaction in social & technological networks to foster value co-creation, in Demirkan, H., Spohrer, J., Krishna, V. (eds.). The Science of Service Systems. Springer. – 2010.

**(Ф 03.02 – 01)**

**АРКУШ ПОШИРЕННЯ ДОКУМЕНТА**

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**АРКУШ РЕЄСТРАЦІЇ РЕВІЗІЇ**

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**АРКУШ ОБЛІКУ ЗМІН**

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**УЗГОДЖЕННЯ ЗМІН**

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