

ODESSA I.I. MECHNYKOV NATIONAL UNIVERSITY
FACULTY OF MATHEMATICS, PHYSICS AND INFORMATION TECHNOLOGIES
DEPARTMENT OF MATHEMATICAL SUPPORT OF COMPUTER SYSTEMS

Syllabus of the course "Multi-agent systems and technologies"

Amount	total number: 5 credits; hours-150; content modules-3
Semester	spring
Days, Time, Place	according to the class schedule
Teacher	Iryna Shpinareva, PhD (Physics and Mathematics), Associate Professor of the Department of Mathematical Support of Computer Systems
Contact phone number	(048)7340723
E-mail	iryna.shpinareva@onu.edu.ua
Workplace	department of mathematical support of computer systems
Consultations	face-to-face consultations: Tuesday from 17.00-18.00 online consultations: ZOOM (link is generated at the beginning of classes)

COMMUNICATION

Communication with students will be carried out by e-mail, in the classroom or via ZOOM.

COURSE ABSTRACT

Subject of the study of the course is the principles of building distributed intelligent systems based on multi-agent technologies.

Course prerequisites

The course material is based on previously acquired knowledge, practical skills and skills of topics and areas related to intelligent systems, distributed systems, high-level programming languages.

Post-requisites of the course

This course is the basis for mastering the following disciplines of the educational and professional master's training program in specialty 126 "Information systems and technologies": "Pre-diploma practice", "Diploma design", disciplines of the training line "Mathematical support of computer systems".

Purpose of the course is the formation of:

- system knowledge of basic concepts and definitions of agents, models and methods of building agent systems and their properties; approaches to the organization of communication between agents in multi-agent systems and basic methods of automated decision-making in multi-agent systems;
- practical skills regarding methods, methods of building multi-agent systems.

Course content

The course covers the basic concepts of agents and multiagent systems (MAS), the main characteristics of agent-oriented programs, the general classification of agents, agent architectures, an overview of tool systems for creating agents and MAS, the main areas of application of agent solutions, interaction between agents in MAS, the concept of organization and its role in the creation of MAS, training in multi-agent systems, service-oriented architecture, requirements for life cycle stages of service-oriented information systems,

EXPECTED RESULTS

As a result of studying the course, the student must

know: basic concepts and definitions of agent systems, models and methods of building agent systems and their properties, technologies and fields of application, agent interaction protocols, criteria for comparing agent models, requirements for life cycle stages of service-oriented information systems.

be able: justify and analyze the choice of a specific type of model and method of developing agent systems when solving practical problems, use modern software tools for designing and researching agent systems; perform the development of multi-agent systems using modern technologies, analyze the results of the construction and use of agent systems when solving applied problems.

Competencies that the student receives as a result of studying the course:

- the ability to develop and apply ICT necessary for solving strategic and current tasks;
- ability to formulate requirements for life cycle stages of service-oriented information systems;
- the ability to model the architecture, behavior and functioning processes of specialized, autonomous and distributed intelligent systems of automated information search and analysis.

Learning outcomes: upon completion of the course, the student will have skills

- make effective decisions on the problems of information infrastructure development, creation and application of IT;
- make a reasonable choice of project solutions and design a service-oriented information architecture of the enterprise (institution, organization, etc.);
- develop and provide support for autonomous distributed intelligent systems of automated information search and analysis.

FORMS AND METHODS OF TEACHING

The course will be taught in the form of lectures (34 hours) and laboratory classes (18 hours), organization of students' independent work (98 hours).

The main training of students is carried out in lectures and laboratory classes, but to a large extent it relies on independent study of the material by full-time students during the semester.

During the teaching of the course, the following teaching methods are used: verbal (lecture, explanation); face-to-face (Power Point presentation); laboratory works; work with literary sources (independent work of students)