Energy Management and Energy Audit of Processing and Food Enterprises

Cycle of Professional and Practical Training
Master's Degree Program
Total Hours: 150 (5 credits)
Instructor: Maryna Savchenko, Ph.D., Associate Professor

Objective of the Course:
The aim of teaching the discipline is to develop students' theoretical and practical skills in the areas of energy management, energy strategies of enterprises focusing on energy efficiency; the energy management matrix; energy use management; methods for assessing the efficiency of energy resource utilization; methodologies for thermal calculations of technological heat-consuming equipment in the food industry; determination of energy characteristics of equipment and technological processes; methods for calculating energy consumption of equipment in processing enterprises; methods for determining thermal balances of food industry enterprises; methods for calculating energy resource losses; principles of rational operation of thermal energy supply systems; methods for utilizing secondary energy resources and alternative and renewable energy sources; methods for saving energy carriers; the general approach to conducting energy audits; types of energy audits; main stages of energy audits; and methods for identifying and reducing losses of various types of energy.

Learning Outcomes:
Upon studying the discipline, students will acquire:

Competencies:

- **GC 1**: Ability to search, process, and analyze information from various sources.
- **SC 4**: Ability to develop programs for the efficient operation of food industry enterprises and/or hospitality establishments in accordance with industry development forecasts in the context of globalization.
- **SC 9**: Ability to organize production and practically implement scientific developments, considering energy efficiency, resource conservation, and improvement of food product quality indicators.

Program Learning Outcomes:

- **PLO 1**: Search, systematize, and analyze scientific and technical information from various sources to solve professional and scientific tasks in the field of food technologies.

- **PLO 3**: Apply specialized equipment, modern methods, and tools, including mathematical and computer modeling, to address complex tasks in food technologies.
- **PLO 5**: Select and implement efficient technologies, equipment, and rational production management methods in practical activities, considering global trends in food technology development.
- **PLO 10**: Plan and conduct scientific research in the field of food technologies, analyze their results, and substantiate conclusions.
- **PLO 15**: Organize the operations of food industry enterprises and hospitality establishments in accordance with occupational safety, resource conservation, and environmental safety requirements.

Course Content:

- Concepts of energy management. Energy conservation and energy auditing.
- Energy management. Accounting for energy resource consumption.
- Conducting energy audits. Assessing the potential for energy conservation.
- Utilization of secondary energy resources and alternative and renewable energy sources as a means of saving primary energy resources and enhancing energy conservation in enterprises.
- Thermal balance of food industry enterprises.
- Methodology for thermal calculations of technological heat-consuming equipment in the food industry.
- Algorithm for calculating energy consumption for objects of energy audits in processing enterprises.