Syllabus of the educational component

Program of educational discipline

Industrial pipeline transport of oil and gas

Code and name of specialty
161 – Chemical technologies and engineering

Institute
Educational and scientific institute for Chemical Technology and Engineering

Educational program
Technology of oil, gas and solid fuel refining processes

Department
Technology of oil, gas and solid fuel refining processes

Educational level
Bachelor

Type of discipline
Optional

Semester
7

Language of teaching
Ukrainian, English

Teachers, developers general information

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General information, amount of publications, main courses, etc.
Learn more about the teacher on the department's website

Abstract

The discipline introduces the modern features of main oil and gas transportation pipelines, taking into account their physical and chemical features, forms practical skills in the calculation of the main structural elements of pipelines and auxiliary equipment

Purpose and objectives of the disciplines

Students' acquisition of knowledge in the field of development and design of objects of the oil refining industry. The study of design stages, modern and promising methods of development of project documentation is foreseen.

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Format of classes

Lectures, practical work, independent work, consultations. The final control is an exam.

Competences

Ability to demonstrate knowledge, understanding and skills in performing pipeline calculations for oil and gas transportation

Learning outcomes

Be able to use modern software complexes for design and operational calculations of technological process parameters of primary and secondary oil processing, transportation and storage of oil and gas

Scope of the discipline

The total volume of the discipline is 120 hours. (4 ECTS credits): lectures – 32 hours, laboratory work – no hours, practical classes – 16 hours, independent work – 70 hours.

Prerequisites for studying the discipline (prerequisites)

Previous disciplines necessary for successful completion of the course:
Processes and devices of chemical technologies
Basics of oil and gas processing technology
Basics of technology of processing of solid combustible fossils
Basics of designing productions for the processing of combustible fossils

Features of the discipline, methods and technologies of education

The discipline is taught using the following traditional types of educational technologies and forms of organization of the educational process:
lecture;
practical training;
independent work;
individual calculation task;
consultation
Conducting lectures is based on an active learning method, in which students take an active part, not only listening to the teacher, but also answering his questions. The teacher prepares in advance a list of questions that stimulate associative thinking and the formation of logical connections with the previously taught material.

Program of educational discipline

Topics of lectures

Topic 1. Transport characteristics and properties of oil and oil products. Types of transport for the transportation of oil and oil products

Topic 2. PIPELINE TRANSPORT OF OIL PRODUCTS. GENERAL INFORMATION. Classification of pipelines

Topic 3. Ways of constructing pipelines. CLASSIFICATION OF UNDERWATER PIPELINE LAYING METHODS

Topic 4. BALLASTING OF UNDERWATER PIPELINES. CONSTRUCTION AND WAREHOUSES OF PIPELINE TRANSPORT

Topic 5. BASIC GAS PARAMETERS AND THE LAWS OF THE GAS STATE. METHODS OF GAS TRANSPORTATION. LIQUEFIED GASES TRANSPORTATION. NATURAL GAS TRANSPORTATION

Topic 6. FEATURES OF PIPELINE GAS TRANSPORT. TERMS. PREPARATION OF GAS FOR FURTHER TRANSPORTATION

Topic 7. Clogging of gas pipelines with foreign objects and hydrate formation.

Topic 8. Problems and prospects of the development of the system of transport pipelines in Ukraine

Topics of practical classes

Topic 1. Physical and chemical properties of oil, basic concepts and problem solving on the topic of determining the density, viscosity and fractional composition of oil by calculation method

Topic 2. Fundamentals of hydrodynamics. Calculation determination of flow modes

Topic 3. Basic information necessary for the design and operation of oil pipelines and oil depots Example of calculation.

Topic 4. Pumps of oil pipelines and oil depots Calculation example

Topic 5. Pipeline transport of low-viscosity oil. Calculation example

Topic 6. Basic gas parameters and laws of the gas state. Calculations of the main characteristics of natural gas

Topic 7. Hydraulic calculation of gas pipelines. Review of existing equations for hydraulic calculations of gas pipelines

Topic 8. Thermal calculation of gas pipelines

Topic 9. Calculation of complex gas pipelines

Topic 10. COMPRESSOR STATIONS OF MAIN GAS PIPES. Definitions and examples of calculations

Topics of laboratory work

Independent work

Individual calculation task with a graphic component.

Literature and educational materials

Basic literature

1. A.H Tulska Lectures for the course of “Industrial pipeline transport of oil and gas”
2. John Bacus Digital sketching Computer-aided conceptual design. Wiley, 2021. — 259 p. — (Practical Revolutions: Disruptive Technologies and Their Applications to Building Design and Construction). — ISBN 9781119640806.
3. Nyemba WR Computer Aided Design: Engineering Design and Modeling using AutoCAD. CRC Press, 2023. — 315 p. — ISBN 978-1-032-26514-8.

Evaluation system

Criteria for evaluating student performance and distribution of points

Distribution of points for evaluating student performance:

Completion of the calculation task - 60
Attending practical classes - 40

Rating scale

Total points	National assessment	ECTS
90–100	Perfectly	A
82–89	Fine	B
75–81	Fine	C
64–74	Satisfactorily	D
60–63	Satisfactorily	E
35–59	Unsatisfactory (requires further study)	FX
1–34	Unsatisfactorily (re-study required)	F

Norms of academic ethics and policy of the course

The student must adhere to the Code of Ethics of Academic Relations and Integrity of NTU "KhPI": show discipline, education, benevolence, honesty, responsibility. Conflict situations should be openly discussed in study groups with the teacher, and if it is impossible to resolve the conflict, it should be brought to the attention of the employees of the institute's directorate.
Regulatory and legal support for the implementation of the principles of academic integrity of NTU "KhPI" is posted on the website:http://blogs.kpi.kharkov.ua/v2/nv/akademichna-dobrochesnist/

Coordination

Syllabus agreed	Date of approval, signature	Head of Department Denys MIROSHNYCHENKO
	Date of approval, signature	Guarantor OP Iryna SINKEVYCH