MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
LUTSK NATIONAL TECHNICAL UNIVERSITY
CUSTOMS AFFAIRS, MATERIALS, TECHNOLOGIES AND HOSPITALITY FACULTY

APPROVED
Dean of the Faculty
_____ Valentyna TKACHUK
29.08.2026

APPROVED
First Vice-Rector
_____ Nadiia KOVALCHUK
29.08.2026

SYLLABUS

of the educational component "Commodity research of motor fuels and lubricants"
higher education degree – Bachelor
field of knowledge – 07 Management and Administration
specialty – 076 Entrepreneurship and Trade
educational programme – Commodity Research and Expertise in Customs Affairs

Commodity Research and Expertise in Customs Affairs Department

Syllabus developed by Dean, DSc, Professor Valentyna TKACHUK

The syllabus was approved at the meeting of the Commodity Research and Expertise in Customs Affairs Department, minutes No. 11 of 26.08.2026

Head of the Department PhD, Associate Professor Olena PAKHOLIUK

Reviewed and approved by the support group of the educational programme "Commodity Research and Expertise in Customs Affairs", minutes No. 5 of 26.08.2026

Guarantor of the educational programme "Commodity Research and Expertise in Customs Affairs" PhD, Associate Professor Halyna HOLODIUK

Approved by the Scientific and Methodological Council of the University, minutes No. 1/a of 29.08.2026

Approved syllabus online:
https://e.lntu.edu.ua/syllabus/3301

Lutsk – 2026

SYLLABUS OF THE EDUCATIONAL COMPONENT "Commodity research of motor fuels and lubricants"

Educational programme	Commodity Research and Expertise in Customs Affairs
Field of knowledge / Specialty	07 Management and Administration / 076 Entrepreneurship and Trade
Level of higher education	first (bachelor's)
Course status	compulsory
Language of instruction	English
Workload	6 ECTS credits / 180 hours, semester 5
Form of final assessment	exam
Lecturer(s)	DSc, Professor Valentyna TKACHUK e-mail: v.tkachuk@lntu.edu.ua

1. Course aim and objectives

Aim: providing students with the necessary knowledge regarding the merchandising of non-food products—specifically fuels and lubricants—preparing them to assess the quality of these products, and studying current regulatory and technical documentation for this product group.

Objectives: study of course terminology; study of petroleum product manufacturing technology; analysis of the product range; study of quality requirements for fuels and lubricants.

Prerequisites: Fundamentals of Goods Production Technology, Product Information, Chemistry and Methods of Analysis, Theoretical Foundations of Commodity Science

2. Competences

IC — integral competence: Ability to solve complex specialized tasks and problems in the fields of entrepreneurial and trade activities or in the course of study, involving the application of theories and methods of organizing and operating entrepreneurial and trading structures, and characterized by complexity and uncertainty of conditions.

GC04 — Ability to communicate in a foreign language.

GC09 — Commitment to preserving the environment.

SC05 — Ability to determine and assess the characteristics of goods and services in entrepreneurial and trade activities.

3. Course structure, distribution of hours, links between topics and competences

No.	Topic	Lectures full-time/ part-time	Pract./ Semin./ lab full-time/ part-time	Self-study full-time/ part-time	Total	Teaching methods	Assessment methods	GC and SC
Content module 1. Types and characteristics of motor fuels, lubricants and special fluids.								
1	Topic 1. Petroleum: classification, chemical composition, properties	2/–	2/–	14/12.25	18/12.25	TM1, TM2, TM3	AM2, AM7	
2	Topic 2. Gasolines	4/2	4/2	14/18.25	22/22.25	TM1, TM2, TM3	AM2, AM7	

No.	Topic	Lectures full-time/ part-time	Pract./ Semin./ lab full-time/ part-time	Self-study full-time/ part-time	Total	Teaching methods	Assessment methods	GC and SC
3	Topic 3. Diesel fuels	4/2	4/2	13/18.25	21/22.25	TM1, TM2, TM3	AM2, AM7	
4	Topic 4. Motor oils.	4/–	2/–	13/18.25	19/18.25	TM1, TM2, TM3	AM2	
5	Topic 5. Special fluids.	4/–	4/–	7/18.25	15/18.25	TM1, TM2, TM3	AM2	
Content module 2. Alternative motor fuels								
6	Topic 6. Alternative fuels: production worldwide and in Ukraine	2/–	2/–	13/14.75	17/14.75	TM1, TM2	AM2, AM7	
7	Topic 7. Biodiesel fuels	4/2	4/2	7/14.5	15/18.5	TM1, TM2	AM2, AM7	
8	Topic 8. Bioethanol	2/–	4/–	13/14.5	19/14.5	TM1, TM2	AM2, AM7	
9	Topic 9. Biogas	2/–	2/–	13/19.5	17/19.5	TM1, TM2	AM2	
10	Topic 10. Requirements for filling station operation.	2/–	2/–	13/19.5	17/19.5	TM1, TM2	AM2	
	Total	**30/6**	**30/6**	**120/168**	**180/180**			

Legend: GC — general competence (number according to section 2); SC — special (professional) competence (number according to section 2). The full wording of each code is given in the educational programme / standard of the specialty.

Teaching methods: TM1 — verbal method (lecture, discussion, interview, etc.); TM2 — practical method (laboratory and practical classes); TM3 — visual method (illustration and demonstration).

Assessment methods: AM2 — oral or written survey; AM7 — presentation of the results of completed tasks and research.

4. Learning outcomes

PLO03. To have skills of written and oral professional communication in the state and foreign languages.

PLO08. To apply acquired knowledge and skills to initiate and implement measures in the field of environmental protection and the safe operation of entrepreneurial and trading structures.

PLO15. To assess the characteristics of goods and services in entrepreneurial and trade activities using modern methods.

5. Sustainable Development Goals

SDG 7 – Affordable and Clean Energy

SDG 12 – Responsible Consumption and Production

6. Non-formal education

Recommended courses, trainings, internships and others: learning outcomes acquired through formal,

non-formal or informal education may be recognized in accordance with LNTU procedures. Evidence may include certificates of thematic trainings, webinars or online courses together with a description of the learning outcomes achieved and, if necessary, a short verification task or portfolio.

7. Assessment criteria and forms of control

Assessment is based on a 100-point scale (national scale / ECTS). Final grade = continuous assessment (30 %) + module tests (30 %) + exam (40 %).

Academic integrity: independent completion of assignments; correct citation of sources; marking parts of the text generated by AI tools. Violations of academic integrity are not tolerated.

8. Content of topics

Topic 1. Petroleum: classification, chemical composition, properties

Classification, chemical composition, properties, labelling.

Topic 2. Gasolines

Global and domestic gasoline market. Classification. Product range. Requirements for quality, transportation and storage.

Topic 3. Diesel fuels

Global and domestic diesel fuel market. Classification. Product range. Requirements for quality, transportation and storage.

Topic 4. Motor oils.

Classification. Quality requirements. Labelling.

Topic 5. Special fluids.

Classification. Quality requirements. Labelling.

Topic 6. Alternative fuels: production worldwide and in Ukraine

Range and raw materials for the production of alternative fuels. Features of their use in internal combustion engines. Advantages and disadvantages.

Topic 7. Biodiesel fuels

Types. Raw materials. Production technology. Quality requirements. Problems of production and use.

Topic 8. Bioethanol

Types. Raw materials. Production technology. Quality requirements. Problems of production and use.

Topic 9. Biogas

Types. Raw materials. Production technology. Quality requirements. Problems of production and use.

Topic 10. Requirements for filling station operation.

Filling station network in Ukraine. Operating requirements. Filling station structure.

9. Individual assignments

Not provided for by the curriculum.

10. General requirements

The educational process is governed by the academic regulations of LNTU. Students are required to read the requirements set out in the LNTU Code of Academic Integrity and the LNTU Policy on the Ethical Use of Artificial Intelligence, and to adhere to the principles of academic integrity and the ethical use of artificial intelligence in their educational activities.

Academic integrity. Participants of the educational process must comply with the Law of Ukraine “On Academic Integrity” of 18.12.2025 No. 4742-IX and the internal regulations of LNTU. Academic plagiarism, fabrication, falsification, misappropriation of authorship, non-independent completion of assignments, as well as dishonest use of results generated by artificial intelligence are not allowed.

Use of artificial intelligence. Artificial intelligence tools may be used to search for ideas, explain

methods, provide preliminary structuring, language editing and auxiliary analysis of non-confidential data, unless a specific assignment requires fully independent work. Students must indicate the tool used, the purpose and the stage of its use, check facts and calculations, and justify their conclusions independently.

11. References

I. Teaching and methodological materials

Works by the syllabus author:

1. Tkachuk V.V., Topilnytskyi P.I. Commodity Science of Fuels and Lubricants: Study Guide. Lutsk: LNTU, 2022. 336 p.

2. Tkachuk V.V., Topilnytskyi P.I. Commodity Science of Fuels and Lubricants: Textbook. Lutsk: LNTU, 2023. 350 p.

3. Identification and Customs Formalities in the Movement of Goods [Text]: Study Guide / Eds. O.V. Pakholiuk and O.I. Peredrii. – Lutsk: LNTU, 2023. – 306 p.

4. Tkachuk V.V., Boichenko S.V., Topilnytskyi P.I. Formation of Lubricant Quality: Study Guide. Lutsk: Vezha-Druk, 2024. 252 p.

5. Tkachuk V., Topilnytskyi P., Chervinskyi T. Alternative Fuels: Textbook / edited by Prof. V. Tkachuk. – Lutsk: Vezha-Druk, 2026. 144 p.

Works by other authors:

6. T. Chervinskyi, P. Topilnytskyi, T. Yarmola. *Operational Materials for Automotive Machinery: A Study Guide*. Lviv: Levada Publishing House, 2020. 326 p.

7. P.I. Topilnytskyi, V.V. Romanchuk. *Technology of Additives, Reagents, and Auxiliary Materials: A Study Guide*. Lviv: Lviv Polytechnic Publishing House, 2022. 175 p.

8. Mazaraki A.A., Merezhko N.V. *Expert Assessment and Customs Clearance of Goods: A Study Guide for Higher Education Students*. Kyiv: Kyiv National University of Trade and Economics, 2019. 368 p.

II. Scientific works

Works by the syllabus author:

9. Tkachuk V. V., Povstianoi O. Yu. Mechanisms for Improving the Environmental Friendliness of Motor Fuels: Monograph. Lutsk: LNTU. 2022. 220 p. URL: https://repository.lntu.edu.ua/handle/123456789/4170

10. Halko S., Tkachuk V., Rechun O. Export-Import Potential of the Motor Fuel Market in Ukraine. Commodity Science Bulletin, 1(14), 2021. 142–154. https://doi.org/10.36910/6775-2310-5283-2021-14-15

11. Halko S. V., Tkachuk V. V. Motor Fuels: Classification and Tariff Regulation of Imports. Bulletin of Lviv University of Trade and Economics. Technical Sciences. Lviv: Lviv University of Trade and Economics. No. 25. 2021. P. 15–23. DOI: https://doi.org/10.36477/2522-1221-2021-25-02

12. Merezhko N., Tkachuk V., Komakha V., Rechun O., Kovalska L. Optimization of diesel fuel composition with bio-component and functional additives. In: Lecture Notes in Mechanical Engineering. 2021. DOI: 10.1007/978-3-030-77823-1_35

13. Merezhko, N., Tkachuk, V., Romanchuk, V., Rechun, O., Zagoruiko, V. High-Octane Fuel Compositions Based on Petroleum and Biocomponents. Lecture Notes in Mechanical Engineering, 2021, pp. 685–694. DOI: 10.1007/978-3-030-68014-5_66

14. V. Tkachuk, O. Rechun, Iu. Melnic Operational properties of diesel fuel with the addition of rapeseed oil esters. Agricultural machinery. Volume 1/8. 2021, Bulgaria. P. 69-72.

15. Merezhko N., Tkachuk V., Komakha V., Povstyanoy O., Karavaiev T. (2022) Optimization of the Composition of High-Octane Gasoline with Bio-Components. In: Tonkonogyi V., Ivanov V., Trojanowska J., Oborskyi G., Pavlenko I. (eds) Advanced Manufacturing Processes III. InterPartner. Lecture Notes in Mechanical Engineering. Springer, Cham. https://doi.org/10.1007/978-3-030-91327-4_59

16. Topilnytskyi P.I., Tkachuk V.V., Rechun O.Yu. (2022). Influence of organochlorine compound content in crude oil on the corrosion of oil transportation equipment. Commodity Research Bulletin, 1(15), pp. 286–297. https://doi.org/10.36910/6775-2310-5283-2022-15-25

17. Dell'Anna, M.M., Tkachuk, V., Rechun, O., Golodyuk, G. (2024). The Use of Biocomponents and Additives to Improve the Quality and Safety of Diesel Fuels. In: Boichenko, S., Zaporozhets, A., Yakovlieva, A., Shkilniuk, I. (eds) Modern Technologies in Energy and Transport. Studies in Systems, Decision and Control, vol 510. Springer, Cham. https://doi.org/10.1007/978-3-031-44351-0_10

18. Topilnytskyy, P., Shyshchak, O., Tkachuk, V., Palianytsia, L., Olesya Chupashko, O. (2024). Advanced Research on the Production, Transportation and Processing of high waxy Oil. Chemistry and chemical Technology. Vol. 18, No. 2, pp. 258–269. https://doi.org/10.23939/chcht18.02.258

III. Information resources

19. DSTU 7687:2015 Euro-grade automotive gasolines. Specifications. Access mode: http://online.budstandart.com/ua/catalog/doc-page.html?id_doc=62187

20. DSTU 7688:2015 Euro-grade diesel fuel. Specifications. Access mode: http://ksv.do.am/GOST/DSTY_ALL/DSTU2/dstu_7688-2015.pdf

21. Technical Regulation on Requirements for Automotive Gasolines, Diesel, Marine, and Boiler Fuels. Access mode: https://zakon.rada.gov.ua/laws/show/927-2013-%D0%BF

22. Mazaraki A.A., Merezhko N.V. Examination and Customs Clearance of Goods: Study Guide for Higher Education Students. Kyiv: Kyiv National University of Trade and Economics, 2019. 368 p.

23. International Trade Statistics. – Access mode: http://www.intracen.org/itc/market-info-tools/trade-statistics/

24. Global Market for Petroleum Products. – Access mode: http://www.economy.nayka.com.ua/?op=1&z=5998

25. OPEC Annual Statistical Bulletin 2018, available at http://www.opec.org/opec_web/static_files_project/media/downloads/publications/ASB2017_13062017.pdf