



Syllabus Course Program



CAD

Specialty

274 – Automobile transport

Educational program

Automobiles and Automobile Industry

Level of education

Bachelor's level

Semester

5

Institute

Institute of Mechanical Engineering and Transport

Department

Car and Tractor Industry (152)

Course type

Special (professional), Obligatory

Language of instruction

English

Lecturers and course developers

**Yevhen Pelypenko**

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PhD, Associate Professor

Department of Car and Tractor Industry

National Technical University "Kharkiv Polytechnic Institute"

Work experience - 10 years. Author of more than 50 scientific and educational and methodological works. Leading lecturer in the disciplines: " Car design and analysis, part 1 ", "Automated design systems for motor vehicles".

[More about the lecturer on the department's website](#)

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General information

Summary

The discipline belongs to the educational and professional bachelor's program. The discipline is aimed at the student's mastery of the skills of working in the automated design system in the field of motor transport.

Course objectives and goals

Familiarity with computer-aided design systems and the principles of its construction, its classification, components, and software, which makes it possible to train specialists in the field of motor transport in the use of modern design programs to solve professional tasks in the field of automotive engineering.

Format of classes

Lectures, laboratory classes, consultations, self-study. Final control in the form of an exam.

Competencies

The ability to develop, taking into account safety, economic, environmental and aesthetic parameters, technical tasks and technical conditions for the design of road transport facilities, its systems and individual elements, to draw up plans for the placement of equipment, technical equipment and organization of workplaces, to calculate equipment loading and quality indicators of technological processes.

The ability to use specialized software to solve complex specialized road transport tasks.

Learning outcomes

Have conceptual scientific and practical knowledge necessary to solve specialized complex problems of road transport, critically understand relevant theories, principles, methods and concepts. Communicate fluently in the state and foreign languages orally and in writing when discussing professional issues. Apply specialized software, information and information and communication technologies to study models of objects and processes of road transport, operational properties of road vehicles, perform engineering and technical and economic calculations, create design documentation and solve other problems of road transport. Make effective decisions, analyze and compare alternative options taking into account goals and limitations, quality assurance issues, as well as technical, economic, legislative and other aspects. Analyze information obtained from research, summarize, systematize and use it in professional activities. Understand and apply in professional activities the regulatory legal and legislative acts of Ukraine, international regulatory documents, Rules for the technical operation of motor transport of Ukraine, instructions and recommendations for the operation, repair and maintenance of motor vehicles, their systems and elements. Develop and implement technological processes, technological equipment and technological equipment, means of automation and mechanization in the process of operation, repair and maintenance of motor transport facilities, their systems and elements. Develop, draw up and implement in production documentation on technological processes for the operation, repair and maintenance of motor vehicles, their systems and other instructions, rules and methods. RN 13. Develop technical tasks and technical conditions for the design of motor transport facilities, its systems and individual elements; draw up plans for the placement of equipment, technical equipment and organization of workplaces, determine the composition and area of premises, calculate equipment loading and product quality indicators. Participate in the development and implementation of engineering and/or production projects in the field of road transport, determine the duration and sequence of work, resource needs, and predict the consequences of project implementation. Present the results of research and professional activities to specialists and non-specialists, argue their position. |

Student workload

The total volume of the course is 180 hours (6 ECTS credits): lectures - 16 hours, laboratory classes - 48 hours, self-study- 116 hours. |

Course prerequisites

To successfully pass the course, you must have knowledge and practical skills in the following disciplines: "Jurisprudence", "Theory of Mechanisms and Machines Part 1", "Car Design and Their Analysis Part 2", "Car Engines, Fuels and Lubricants", "Applied Methods of Calculations in Motor Vehicles", "Physical Education".. |

Features of the course, teaching and learning methods, and technologies

Lectures are interactive, using multimedia technologies. Laboratory classes use a project approach to learning, focusing on the application of information technologies. |

Program of the course

Topics of the lectures

Topic 1. Plane drawing.

Topic 2. Solid modeling. |

Topics of the workshops

Practical work within the discipline is not provided. |

Topics of the laboratory classes

Topic 1. Getting to know the program desktop.

Topic 2. Editing a drawing.

Topic 3. Making a working drawing of a body part.
 Topic 4. Making a working drawing of an original part.
 Topic 5. Making a working drawing of a gear-type part.
 Topic 6. Making a working drawing of a shaft.
 Topic 7. Making an assembly unit.
 Topic 8. Creating a "Fork" part.
 Topic 9. Creating a "Bush" part
 Topic 10. Creating a "Gasket" and "Cover" part
 Topic 11. Building a "Shaft" part and creating a drawing blank.
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Self-study

|Students are also recommended additional materials (videos, articles) for independent study and analysis. |

Course materials and recommended reading

|A list of sources of information and materials formatted in accordance with the standards. It's possible to split the list into sections, e.g. Compulsory materials and Additional materials, etc.

Compulsory materials

1. Osnovy avtomatyzovanoho proiektuvannia : navchalnyi posibnyk / S.M. Pavlovskiy, A. V. Babkov. – Odesa : Helvetyka, 2021. – 598 s
2. Hrafichna systema AutoCAD. Osnovy mashynobudivnoho kreslennia, modeliuvannia ta animatsii : laboratornyi praktykum / V.I. Topchii, I.S. Aftanaziv, P.P. Voloshkevych. – Lviv : Lvivska politekhnik, 2019. – 388 s.
3. Kompiuterna hrafika : AutoCAD : navchalnyi posibnyk / M.M. Koziar, Yu.V. Feshchuk. – Odesa : Helvetyka, 2020. – 304 s.
4. Systemy 3D modeliuvannia. Navchalnyi posibnyk. / Zinko R. V., Topilnytskyi V. H. – Lviv : Halytska Vydavnycha Spilka, 2017. – 150 s.
5. Osnovy SAPR v avtomobilebuduvanni : navchalnyi posibnyk / O.M. Artiukh, O.V. Dudarenko, V.V. Kuzmin ta in. Zaporizhzhia : NU «Zaporizka politekhnik», 2021. 168 s.
6. Topchii V. I. Hrafichna systema AutoCAD. Osnovy mashynobudivnoho kreslennia, modeliuvannia ta animatsii. Laboratornyi praktykum / V. I. Topchii, I. S. Aftanaziv, P. P. Voloshkevych. Lviv: Vydavnytstvo Lvivskoi politekhniki, 2019. 388 s. |

Additional literature

1. Autodesk [Elektronnyi resurs]. Rezhym dostupu do resursu: <https://www.autodesk.com/education/edu-software/overview>.

Assessment and grading

Criteria for assessment of student performance, and the final score structure

Exam. Current assessment: 2 online modular tests.
Performing calculation work. |

Grading scale

Total points	National	ECTS
90–100	Excellent	A
82–89	Good	B
75–81	Good	C
64–74	Satisfactory	D
60–63	Satisfactory	E
35–59	Unsatisfactory (requires additional learning)	FX
1–34	Unsatisfactory (requires repetition of the course)	F

Norms of academic integrity and course policy

The student must adhere to the Code of Ethics of Academic Relations and Integrity of NTU "KhPI": to demonstrate discipline, good manners, kindness, honesty, and responsibility. Conflict situations should be openly discussed in academic groups with a lecturer, and if it is impossible to resolve the conflict, they should be brought to the attention of the Institute's management. Regulatory and legal documents related to the implementation of the principles of academic integrity at NTU "KhPI" are available on the website: <http://blogs.kpi.kharkov.ua/v2/nv/akademichna-dobrochesnist/> |

Approval

Approved by

Date, signature

Head of the department
Oleksii REBROV

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Guarantor of the educational
program
Andrii KOZHUSHKO