____ AUTOMATED ROAD DESIGN SYSTEMS___

(course title)

COURSE SYLLABUS ABSTRACT
of higher education institution

Specialty 7-07-0732-01 «Construction of buildings and structures»

Concentration «Road of Construction»

	STUDY MODE	
	full-time	part-time (shortened program)
Year	3	3
Semester	5, 6	5,6
Lectures, hours	32	8
Laboratory classes, hours	68	16
Course paper, semester	7	7
Pass/fail, semester	5,6	5, 6
Contact hours	100	24
Independent study, hours	116	192
Total course duration in hours / credit units	216/6	

1. Course outline

The aim of the academic discipline is to develop students' knowledge, skills and abilities in working in modern automated road design systems, as well as the development of an analytical approach to solving practical problems, taking into account the requirements of modern design standards, economic and environmental requirements imposed on roads as complex structures of the transport system.

2. Course learning outcomes

Upon completion of the course, the student should know: principles of automated design of highways; design and principles of generating calculation schemes and source documents; principles of selecting the necessary equipment and devices to create a designer's workplace; fundamentals of automated design of highways and artificial structures on them; principles of building automated design systems; means of supporting automated design systems; modern technologies for producing design and survey work when designing at the CAD-AD level; elements of an automated design system for transport structures (highways); features of automated design of individual elements of highways; basic principles of building computer-aided design (CAD) systems; the functional structure of CAD-AD, modern means of collecting and processing data; technology of system automated design; design methods in CAD-AD based on the implementation of the principles of strength, safety and optimization of design solutions. be able to: produce automated design of a highway route plan; determine the characteristics of a catchment area; design a longitudinal profile of a highway using the optimization method; develop transverse profiles of a highway; design urban-type highways; perform calculations of non-rigid road pavement in the CREDO RADON BY software package; design individual road signs in the CREDO ZNAK program; perform calculations of rain flood and melt water runoff in the CREDO GRIS_S program; perform calculations of the capacity of a "smooth" round pipe in the CREDO GRIS_T program; calculate bills of quantities of work; create and edit drawings of design solutions in various computer-aided design systems (Autodesk AutoCAD, Credo Roads, Autodesk Civil 3D) apply CAD in the field of highway design; import graphic material into universal technical graphics systems (AutoCAD); conduct preliminary feasibility studies of design solutions; develop design and working technical documentation; draw up completed design and engineering calculations. have the skill of: system analysis of highway design; design of planned geometry of road objects; design of longitudinal and transverse profiles of highways; drawing up drawings using CAD tools (Credo, AutoCAD); obtaining, storing and processing information in the CREDO Roads software package, working with a computer as a means of managing information in the field of designing transport structures; calculating the optimal design of non-rigid road surfaces, working in the field of automated design of highways; calculating small culverts.

3. Competencies

As a result of mastering the discipline, the student should have the following competencies: Be capable of self-development and improvement in professional activities, develop innovative receptivity and the ability to innovative activities. Apply computer technologies in solving engineering problems to create a digital terrain model for engineering use. Perform automated design of transport structures using software packages, apply architectural and design solutions. Use innovative methods and technologies for the design and construction of transport communications, the manufacture of road construction materials and their examinations.

4. Requirements and forms of midcourse evaluation and summative assessment.

The following forms are used to diagnose competencies: – oral; – written; – oral and written. The following diagnostic tools are used to assess the level of students' knowledge: – preparation of abstracts and reports at conferences; – publication of articles, reports; – passing a test; – reports on laboratory work with their oral defense.