BASICS OF DESIGN AUTOMATION IN CONSTRUCTION
Course syllabus abstract of higher education institution speciality
1–70 02 01 Industrial and Civil Engineering

	STUDY MODE		
	full-time	part-time	part-time (shortened program)
Year	2,3	3,4	2
Semester	4,5	6,7	4
Lectures, hours	50	12	8
Lab classes , hours	68	14	6
Exam, semester	4,5	6,7	4
Contact hours	118	26	14
Independent study, hours	110	202	214
Total course duration in hours / credit units	228/6		

1. Course outline
1. Introductory lecture. Basic concepts of computer-aided design and engineering design.
2. Types of BIM design. Classification.
3. 2D CAD systems.
4. 3D CAD systems.
5. Basic principles of PC Autodesk Revit and analogues.
6. Basic principles of Robot operation and analogues.
7. Photogrammetry and laser scanning during design and survey work.
8. Project presentation technologies.
9. Software of organizational and technological planning.
10. Principles of implementation of BIM technologies.
11. Optimization of design decisions in computer-aided design.
12. Operation of buildings and structures using BIM.
13. Design of engineering networks using BIM.
14. Information retrieval systems.
15. Labor protection and fire safety in the context of BIM.
16. Trends and prospects for the development of BIM technologies.

2. Tasks of the discipline

The objectives of the discipline are the acquisition of knowledge and skills necessary for successful work in any of the branches of the construction profile.

Knowledge and skills of a civil engineer in the specialty 1-70 02 01 "Industrial and civil construction" is determined by the qualification characteristic.

As a result of mastering the academic discipline, the student must

know: areas of application of specialized software and have a level of knowledge corresponding to the Certified User of the following software: IPS StroyDOCUMENT, IPS StroyConsultant, Allplan, ArchiCAD, Revit, Renga, AutoCAD, Nanocad, ZWCAD, KOMPAS, SketchUp, Microsoft Excel, Microsoft Project, Robot, SCAD, Lyra, Lumion, 3d max, BIMx, Enscape, and other software systems designed to solve computer-aided design problems, including analogues.

be able to: set and solve problems related to the design of buildings and structures; to model and perform the necessary engineering calculations, as well as to be able to present and visualize the results of their activities in accordance with the regulated requirements for the system of design and estimate documentation and at a high professional and aesthetic level; update the acquired theoretical and practical skills.

possess: mandatory skills that meet modern requirements for a qualified civil engineer; skills in analyzing the latest achievements of science in the field of construction

3. Competencies

BPK-2. Apply software tools to solve engineering problems.
BPK-4. To carry out graphic constructions on a plane and in space to solve professional problems.
SK-1. Use software tools to solve practical problems and master the basic software tools for automating the development of technological and design documentation.

4. Requirements and forms of midcourse evaluation and summative assessment

The current certification of students is carried out to determine the compliance of the results of their educational activities with the requirements of educational standards, educational and program documentation of educational programs of higher education. The form of the current certification of students is an exam. The current certification is carried out orally and in writing. The form of intermediate certification is an individual task and rating control.

The final assessment is determined according to the tables:

Assessment	10	9	8	7	6	5	4	3	2	1	0
Points	100-94	93-87	86-80	79-72	71-65	64-58	57-51	50-41	40-17	16-1	0