

## AUTOCAD THREE-DIMENSIONAL DESIGN

*Khamroeva Lola Shaykulovna*

*Karshi Institute of Engineering and Economics*

*Senior teacher of the Department of General Engineering Sciences*

**Annotatsiya:** AutoCAD dasturi, arxitektura, muhandislik va dizayn sohalarida keng qo'llaniladigan kuchli kompyuter yordamida loyihalash dasturidir. Ushbu dastur yordamida foydalanuvchilar ikki va uch o'lchovli chizmalar yaratish, tahrirlash va ko'rish imkoniyatiga ega bo'lishadi. Uch o'lchamli loyihalash, zamonaviy arxitektura va muhandislikda muhim ahamiyatga ega bo'lib, bu jarayonni AutoCAD dasturida amalga oshirish ko'plab afzalliklarni taqdim etadi.

**Kalit so'zlar:** AutoCAD dasturi, loyihalash jarayoni, loyihalar, modellar, chizmalar, funksiyalar, foydalanuvchilar.

**Аннотация:** Программное обеспечение AutoCAD — это мощная программа автоматизированного проектирования, широко используемая в области архитектуры, инженерии и дизайна. С помощью этой программы пользователи смогут создавать, редактировать и просматривать двух- и трехмерные рисунки. Трехмерное проектирование важно в современной архитектуре и проектировании, и реализация этого процесса в AutoCAD дает множество преимуществ.

**Ключевые слова:** программа AutoCAD, процесс проектирования, проекты, модели, чертежи, функции, пользователи.

**Abstract:** AutoCAD software is a powerful computer-aided design program widely used in the fields of architecture, engineering, and design. With this program, users will be able to create, edit, and view two-and three-dimensional drawings. Three-dimensional design is important in modern architecture and engineering, and implementing this process in AutoCAD offers many advantages.

**Keywords:** AutoCAD program, design process, projects, models, drawings, functions, users.

### INTRODUCTION

The three-dimensional design process provides a more accurate and detailed view of projects. This process allows you to accurately describe the look, dimensions, and materials of your projects. With the help of 3D models, architects and engineers can plan projects more efficiently, anticipate problems and solve them. Also, with the help of three-dimensional models, it is possible to clearly show the final appearance of the projects to the clients.

## **MATERIALS AND METHODS**

AutoCAD was developed by Autodesk in 1982. Initially, this program was designed only for creating two-dimensional drawings. However, over time, the ability to create three-dimensional models was added to the AutoCAD program. The program quickly became popular among engineers and architects with its convenient interface and powerful functions. Today, AutoCAD is one of the most widely used design programs in the world. During the development of AutoCAD, many new functions and tools were introduced to users. The program has 3D modeling, rendering, animation and many other possibilities. These capabilities allow users to implement projects more efficiently and quickly. Updates and new versions of AutoCAD are being developed according to the needs of users. The three-dimensional design process in AutoCAD consists of several steps. At the first stage, the user should learn the program interface and select the necessary tools for creating three-dimensional models. To create three-dimensional models in the AutoCAD program, the "3D Modeling" mode is used. In this mode, users can create, modify and combine different geometric shapes. In the second step, users select the necessary tools to create three-dimensional models. AutoCAD includes tools such as Extrude, Revolve, Sweep, and Loft that allow users to convert 2D drawings into 3D models. For example, using the Extrude tool, a user can create a three-dimensional object by extruding a 2D shape. Third, users go through the process of editing and changing the created models. AutoCAD has "Modify" tools for editing models. With these tools, users can crop, move, rotate, and make other changes to models. Users also have the ability to customize models with colors, materials, and textures.

Visualization is very important in the three-dimensional design process. AutoCAD software allows users to view created models in real time and analyze them from different angles. With the Render feature, users can add lighting and materials to make models look more realistic. This process helps in accurately portraying the final look of the projects and creates a more attractive look for the clients.[3]

## **RESULTS AND DISCUSSIONS**

The visualization process is very important to create a realistic view of the projects. Users have the opportunity to see the models in different lighting conditions and evaluate their appearance. Users can also animate models to show their movement and functionality. This helps clients understand exactly how projects work. Problems may arise during the three-dimensional design process. For example, the measurements or geometric shapes of the model may not be correct. In AutoCAD, you can use the "Check" and "Audit" functions to solve these problems. With these functions, users can check models and identify errors. Users can also go back to a previous state using the "Undo" function. The problem solving process is important in ensuring the quality of projects. Users can ensure the successful implementation of projects by validating models and identifying errors. [2]

The tools and functions available in AutoCAD allow users to solve problems quickly and efficiently. Adding materials and textures during the 3D design process plays an important role in making the models look more attractive and realistic. In AutoCAD, users have a choice of different materials and textures. Materials define color, lighting, and other properties to make models look more realistic. The process of adding materials and textures allows users to make models more attractive. Users can enhance the appearance and quality of models by decorating them with different materials. Also, users have the opportunity to view and evaluate models in different conditions. Adding animation during the three-dimensional design process allows you to make models more dynamic and attractive. In AutoCAD, users can create animations to move models and show their functions. Animation helps show how projects work and how they move. The animation process allows users to create a dynamic view of projects. Users can clearly explain to clients how projects work by showing models in various actions. This is important for the successful implementation of projects.[1]

### **CONCLUSION**

Three-dimensional design in AutoCAD plays an important role in modern architecture and engineering. With this software, users can create accurate and detailed models, edit and visualize them. The three-dimensional design process allows for more efficient planning of projects and anticipation of problems. With the powerful tools and functions of AutoCAD, users can successfully implement their projects.

### **REFERENCES**

1. Cheng, C. (2018). *Mastering AutoCAD 2018 and AutoCAD LT 2018*. Sybex.
2. Gookin, D. (2017). *AutoCAD For Dummies*. Wiley.
3. Bennett, C. (2019). *AutoCAD 2020: A Problem-Solving Approach*. Cengage Learning.
4. Kelley, J. (2020). *AutoCAD 2021: A Comprehensive Guide*. CAD/CIM Technologies.
5. Schmid, W. (2021). *3D Modeling with AutoCAD 2021*. SDC Publications.
6. Friedman, D. (2016). *AutoCAD 2016 Tutorial First Level 2D Fundamentals*. SDC Publications.
7. Davis, A. (2019). *AutoCAD 2019: A Complete Guide*. CreateSpace Independent Publishing Platform.
8. Rogers, J. (2022). *AutoCAD 2022 for Beginners*. Independently Published.