



2D and 3D visualization of Kalinga University Main Building by CAD Software

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Abstract- This research paper study about AutoCAD software which has been used to explore the visualization of building in 2D and 3D. As we all know in recent years, how the AutoCAD software is continuously improving and contributing towards design and visualization of the buildings in 2D and 3D.

During the research I have closely work with the different commands of the AutoCAD software. At that time, I have handled various commands of AutoCAD in 2D and 3D and also got a chance to go through the research to the different parts of the buildings. I have learned to work in Multi work-based design which not only enriched me professionally but also helped me to grow personally as well. My contribution was appreciated by my team members and other member of department. I have a great opportunity to practically see how design in 2D and 3D is working. However, this research paper is written in very short period of time. I have tried my level best to make it meaningful by reflecting my work at the designs and visualization of the main building of Kalinga University.

Keywords- CAD, Building, Visualization, Create, Commands, Planning.

Introduction-

Kalinga University has emerged as a Centre of excellence of higher education in Central India which has started carving a niche for itself in the education domain and is rising as a shining star on the horizon in the education quality. Kalinga University is a 30 acres wi-fi campus which has been carefully designed to conform to world standards. Main Block is fully airconditioned and comprises of office spaces for faculty members, computer labs, regular class rooms, smart class room, laboratory, library and a well-managed auditorium.

Kalinga University is totally a green campus and fully run by solar power. This university promotes environment friendly initiative which includes plastic free campus, rain water harvesting, sewage treatment plant, water recycling, battery vehicles, proper waste management and other which make this university different from others university.

Compared to their basic ancestors, modern computers are more powerful and more inexpensive. Moreover, software has improved and made tasks simpler, notably in CAD and 3D programs. The simplicity and power of CAD 2D and 3D s have

grown dramatically along with computer speed. The user of AutoCAD can produce realistic presentations by using creative imagination and novel concepts. It offers the resources and processes required to create fantastic things.

Prior to the development of CAD software, designers could only produce 2D drawings using manual hand drafting instruments including drafting boards and pencils, parallel rulers, compasses, and triangles. Because of its automated set of tools and functions, AutoCAD, which debuted in 1982, has quickly become the most used CAD application. In the AutoCAD stream, it was a huge benefit.

Literature Review-

1. Artem Obukhov, Denis Dedov, Artem Sveshnikov and Nadezhda Vekhiteva et.al (17 July 2022) stated that; "Development of Navigation Systems in Educational Buildings of Higher Educational Institutions" The article covers the navigational issues that arise when educational institutions undergo structural reconstruction, which deviates from the accepted norms for room naming inside a structure. Two theoretically novel methods are suggested based on the analysis that was done. A virtual interactive trip system is the first answer, followed by a stand-based navigation system and a mobile app.

2. Chenxi Tian et.al (2020) stated that; "3D Modeling and Digital Preservation of Ancient Architectures Based on AutoCAD and 3DMAX". The growth of digital technology in recent years has made this new kind of technology an excellent tool for the preservation and restoration of historic structures. The three-dimensional modelling of historic buildings is done in this study using AutoCAD and 3DMAX, allowing for the digital preservation of priceless architectural artefacts.

3. Hao Zhao, runcai Bai, Guangwei et.al (December 2011) stated that; "3D

Modeling of Open Pit Based on AutoCAD and Application". The creation of a 3D geological model of an open pit serves as a platform for information in the development of a digital mine and is crucial to the management of open pit production and engineering design. It creates a visual representation of the 3D geological model for the open pit, builds a block model in accordance with the coal and rock solid model, adds an attribute, gives it a value, and uses the model to calculate the open pit's stripping and mining rates.

Methods or steps of Design

First you have to take a survey of the main building and the second steps for the plan and visualization of the main building begins to research and measurement of the various component of the building such as length and width of the building, length and width of the room, size of corridor, auditorium, rise and thread of stair, size of the door and window, height of the building etc. you have to roughly draw the plan of the building on the paper. Then after getting each data and rough layout of the plan of the building you have to start the drawing of the plan on AutoCAD in 2D. The different commands used in AutoCAD 2d for drawing the building plan are line, rectangle, copy, move, trim, fillet, erase, mirror, arc, text, offset, stretch etc. While using AutoCAD, the Hatch command is used to fill patterns inside of enclosed spaces. Hatched, gradient and solid fill patterns are present. After the completion of plan in 2D, we start to draw in 3D. To switch the workspace to one that shows tools for creating and modifying 3-D objects, select the drop-down list at the top of the programme window, then pick the "3-D modelling" item. To reach the "Modeling" panel, click the "Home" option. From there, you may use the different tool to transform 2D plan into 3D forms. The commands used to draw the 3D are extrude, pushful, array, subtract, move, copy, mirror, 3D rotate, 3d polyline etc.

Extrude is the basic commands of AutoCAD 3D. once you complete the 2D, the first command used in cad 3D is extrude command. Select the portion which you want to extrude and the drag the mouse in the same direction in which you want to extend and specify the point up to which you want to extend.

Using the PushPull command is another technique to resize and shape an item. Just use the PushPull command after selecting the face you want to move. Then, click after dragging the mouse to the necessary location. Instead, you can manually enter the distance and press Enter to execute the instruction.

Results and Discussion: -

The design of 2D and 3D of building by using AutoCAD software's which consist of commands like line, move, copy ,trim ,fillet, rotate, mirror, extrude, push full and subtract are used to create the modelling of educational building which is shown in below figures. This plan of ground floor and first floor which has different class rooms offices reception auditorium, computer lab ,washroom , admin office all are shown by 2D and 3D modelling tools.



Fig: 1.1 Ground floors

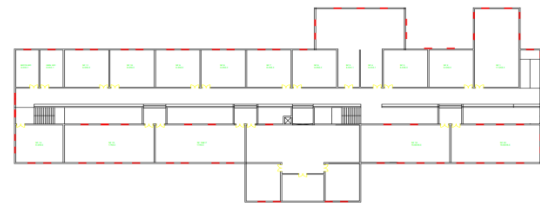


Fig: 1.2 First floors

Conclusion-

All of a person's software selection decisions are based on their usage requirements and the particular project at hand. The ability to use a variety of CAD 2D and 3D software programmes really gives students more freedom to conceptualise and present their ideas. They employ the different 2D and 3D commands with which they are most at ease. Some students enjoy trying new things, and knowing various programmes opens up new opportunities for producing superior projects. Others just use a small number of programmes, or maybe only one, like AutoCAD, to produce quality work. One of the primary issues that arose during the experiment's design phase was how to quickly and freely show 3D models on mobile devices and blogging platforms. We think that the accessibility and usability of technology for instructors and students play a significant role in the success of a technology-based education.

Making accurate sketches is made easier by this software's ability to calculate mass, area, and volume. It is a commonly utilised programme since there are less human errors. Modifying and changing designs is also made simple with AutoCAD. This facilitates design review and paves the route for excellence. Backup, transfer, import, and export settings are available in AutoCAD and utilized in numerous sectors for big projects, so there are a lot of individuals and big files involved. A large design team can work together on the same project simultaneously with the help of this computer-aided design software.

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