A Course Based Project Report on

CREATING A BICYLCE

Submitted to the

Department of Electronics and Instrumentation Engineering

in partial fulfilment of the requirements for the completion of course

ENGINEERING DRAWING

BACHELOR OF TECHNOLOGY

IN

ELECTRONICS AND INSTRUMENTATION ENGINEERING

Submitted by

23071A1090	KARRI SOUMYA
23071A1091	KATTA SUSMITHA
23071A1092	KAUSAR FIRDOUS
23071A1093	KHANDESH VISHWATEJA
23071A1094	KALYAN RAM

Under the guidance of

MR. TAPPA RAJU

DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION ENGINEERING

VALLURUPALLI NAGESWARA RAO VIGNANA JYOTHI INSTITUTE OF ENGINEERING & TECHNOLOGY

An Autonomous Institute, NAAC Accredited with 'A++' Grade, NBA

Vignana Jyothi Nagar, Pragathi Nagar, Nizampet (S.O), Hyderabad – 500 090, TS, India

JUNE 2024

VALLURUPALLI NAGESWARA RAO VIGNANA JYOTHI
INSTITUTE OF ENGINEERING AND TECHNOLOGY
An Autonomous Institute, NAAC Accredited with 'A++' Grade, NBA Accredited for CE, EEE, ME, ECE, CSE, EIE, IT B. Tech Courses, Approved by AICTE, New Delhi, Affiliated to JNTUH, Recognized as "College with Potential for Excellence" by UGC, ISO 9001:2015 Certified, QS I GUAGE Diamond Rated
Vignana Jyothi Nagar, Pragathi Nagar, Nizampet(SO), Hyderabad-500090, TS, India

DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION ENGINEERING

CERTIFICATE

This is to certify that the project report entitled "**Creating a bicycle using Autocad**" is a bonafide work done under our supervision and is being submitted by Ms. K. Sowmya (23071A1090), Ms. Susmitha (23071A1091),Ms. Kausar Firdous (23071A1092), Mr. K Vishwateja (23071A1093), Mr. Kalyan Ram (23071A1094) in partial fulfilment for the award of the degree of **Bachelor of Electronics and Instrumentation Engineering**, of the VNRVJIET, Hyderabad during the academic year 2023-2024.

Tappa Raju

Department of automobile

Dr. Manjula sri

Professor& HOD
Department of EIE

Course based Projects Reviewer

VALLURUPALLI NAGESWARA RAO VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

An Autonomous Institute, NAAC Accredited with 'A++' Grade,
Vignana Jyothi Nagar, Pragathi Nagar, Nizampet(SO), Hyderabad-500090, TS, India

DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION ENGINEERING

DECLARATION

We declare that the course-based project work entitled "**Creating a Bicycle using Autocad**" submitted in the Department of Information Technology, Vallurupalli Nageswara Rao Vignana Jyothi Institute of Engineering and Technology, Hyderabad, in partial fulfilment of the requirement for the award of the degree of **Bachelor of Electronics and Instrumentation Engineering** is a bonafide record of our own work carried out under the supervision of **Tappa Raju.** Also, we declare that the matter embodied in this thesis has not been submitted by us in full or in any part thereof for the award of any degree/diploma of any other institution or university previously.
Place: Hyderabad.

ACKNOWLEDGEMENT

We express our deep sense of gratitude to our beloved President, Sri. D. Suresh Babu, VNR Vignana Jyothi Institute of Engineering & Technology for the valuable guidance and for permitting us to carry out this project. With immense pleasure, we record our deep sense of gratitude to our beloved Principal, Dr. C.D Naidu, for permitting us to carry out this project.

We take immense pleasure to express our deep sense of gratitude to our beloved Guide, Mr.**Tappa Raju** for his valuable suggestions and rare insights, for constant source of encouragement and inspiration throughout my project work.

We express our thanks to all those who contributed for the successful completion of our project work.

23071A1090	KARRI SOUMYA
23071A1091	KATTA SUSMITHA
23071A1092	KAUSAR FIRDOUS
23071A1093	KHANDESH VISHWATEJA
23071A1094	KALYAN RAM

ABSTRACT

Creating a bicycle using AutoCAD involves designing a detailed digital model to achieve various objectives, including design and prototyping, technical documentation, customization, analysis, simulation, and 3D printing.

This process enables designers to visualize and refine the bicycle, produce precise technical drawings for manufacturing, customize components for specific needs, and conduct structural analyses to ensure safety and performance. Additionally, it facilitates the creation of high-quality marketing visuals and educational materials.

By leveraging AutoCAD's capabilities, the development process becomes more efficient and effective, allowing for quick iterations, cost savings, and the production of accurate, reliable bicycle models.

TABLE OF CONTENTS

1.INTRODUCTION

1.1 PROBLEM DEFINITION:

Design and Create a bicycle using AutoCAD

1.2 OBJECTIVE:

Creating a bicycle in AutoCAD aims to design and prototype, generate technical documentation, customize designs, perform analysis and simulation, create marketing visuals, educate, and facilitate 3D printing. This process enhances visualization, precision, customization, safety, and efficiency in bicycle development, catering to diverse needs and applications.

2.PROCEDURE

Creating a detailed drawing of a bicycle in AutoCAD involves several steps due to its complex structure. Here's a simplified step-by-step procedure:

 # Step 1: Setting Up

1. Open AutoCAD.
2. Set Units:
   - Type `UNITS` in the command line and press Enter.
   - Set the units to millimeters or inches based on your preference.

 # Step 2: Drawing the Frame

1. Start a New Drawing:
   - Use the `LINE` command to draw the main frame structure.
   - Draw a horizontal line representing the top tube.
   - Draw a diagonal line from one end of the top tube to create the down tube.
   - Connect the other end of the top tube with the bottom of the down tube to form the seat tube.
   - Draw a horizontal line for the chainstay and connect it to the bottom bracket.

 # Step 3: Drawing the Wheels

1. Front Wheel:
   - Use the `CIRCLE` command.
   - Specify the center and radius (typically around 350mm for a standard bicycle wheel).
2. Rear Wheel:
   - Use the `CIRCLE` command again.
   - Place it in alignment with the chainstay and seat tube.

 # Step 4: Drawing the Fork

1. Front Fork:
   - Use the `LINE` command to draw the fork from the top of the head tube to the center of the front wheel.
   - Draw two parallel lines to represent the fork blades.

 # Step 5: Drawing the Handlebars

1. Handlebar Stem:
   - Use the `LINE` command to draw the stem from the top of the head tube.
2. Handlebars:
   - Draw a horizontal line from the end of the stem to represent the handlebars.

 # Step 6: Drawing the Seat

1. Seat Post:
   - Use the `LINE` command to draw a vertical line from the top of the seat tube.
2. Seat:
   - Draw a horizontal line at the top of the seat post.

 # Step 7: Drawing the Pedals and Crankset

1. Crankset:
   - Use the `CIRCLE` command to draw a small circle at the bottom bracket.
2. Pedals:
   - Draw two lines extending from the center of the crankset to represent the pedal arms.

 # Step 8: Drawing the Chain

1. Chain:
   - Use the `POLYLINE` command to draw the chain from the crankset around the rear wheel.

 # Step 9: Adding Details

1. Brake Calipers:
   - Draw small rectangles or circles where the brakes would be mounted.
2. Derailleur and Gears:
   - Draw additional small circles and lines to represent the derailleur and gear set.

 # Step 10: Finalizing the Drawing

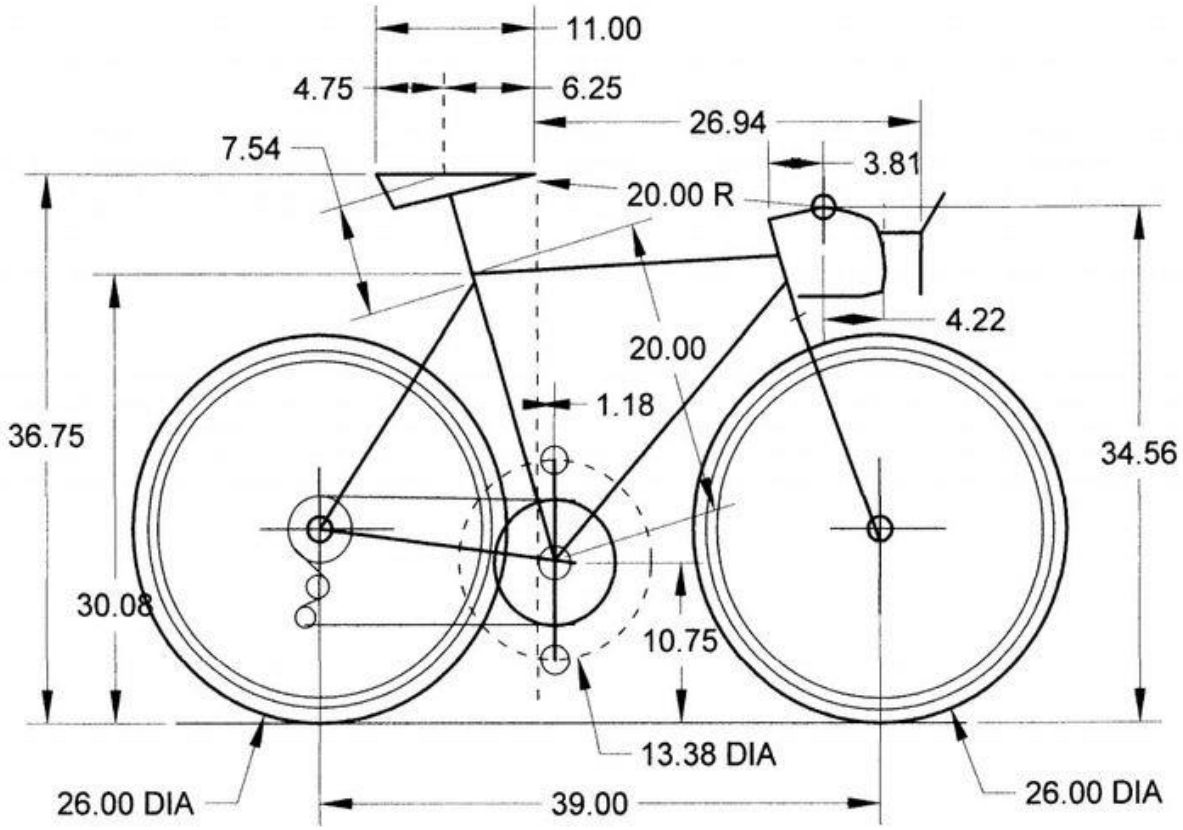
1. Adjust and Clean Up:
   - Use the `TRIM` and `ERASE` commands to clean up any unnecessary lines.
2. Annotations:
   - Use the `TEXT` command to add labels to different parts of the bicycle.

3D Printing:

3D printing, also known as additive manufacturing, is a process of creating three-dimensional objects by layering material one layer at a time based on a digital model. This technology has gained popularity due to its versatility and the ability to produce complex and customized objects quickly. The basic steps involved in 3D printing include:

1. Creating a 3D Model:
   - The first step is to create a digital 3D model of the object you want to print. This can be done using computer-aided design (CAD) software such as AutoCAD.
2. Slicing the Model:
   - The 3D model is then sliced into thin layers using slicing software. This generates a set of instructions for the 3D printer, indicating how each layer should be printed.
3.Printing:
   - The 3D printer reads these instructions and starts building the object layer by layer. Various materials can be used for 3D printing, including plastics, metals, ceramics, and more.
4. Post-Processing:
   - After the printing is complete, some objects may require post-processing steps such as removing support structures, sanding, or painting to achieve the desired finish.

This procedure gives a basic outline for drawing a bicycle in AutoCAD. You can add more details and components based on the specific design and requirements of your project.


11.00
4.75
6.25
26.94
7.54
3.81
20.00 R
4.22
20.00
1.18
36.75
34.56
30.08
10.75
13.38 DIA
26.00 DIA
39.00
26.00 DIA

3.CONCLUSION

In conclusion, AutoCAD's application in bicycle design revolutionizes the industry with its precise modeling capabilities, facilitating iterative design processes that optimize performance and safety. The software enables comprehensive analysis, customization of components, and efficient prototyping via 3D printing. By producing detailed technical documentation and captivating marketing visuals, AutoCAD enhances product development from conception to market launch. Its role in education also nurtures future designers and engineers. Ultimately, AutoCAD empowers designers to innovate, ensuring bicycles are not only functional but also meet diverse user preferences, thus advancing both technological standards and consumer satisfaction in the cycling industry.