Lab 2. Micrometer

Name-Surname : **Date :**

Student No. : **Group :**

Tools
ATTENTION! – All equipment and samples will be given during the experiment.

- **Micrometer:** Micrometer provides more accurate measurements (in microns) for small lengths. Figure 2 shows a micrometer caliper with 0.01 mm precision.

Figure 1. A micrometer.

- **Hexagonal Head Bolt, Allen Bolt and Nut**

(a)

(b)

Figure 2. a) Hexagonal Head Bolt and Its Nut, b) Allen Bolt

- **Plain Washer and Spherical Ball**

(a)

(b)

Figure 3. a) Plain washers, b) Spherical Balls

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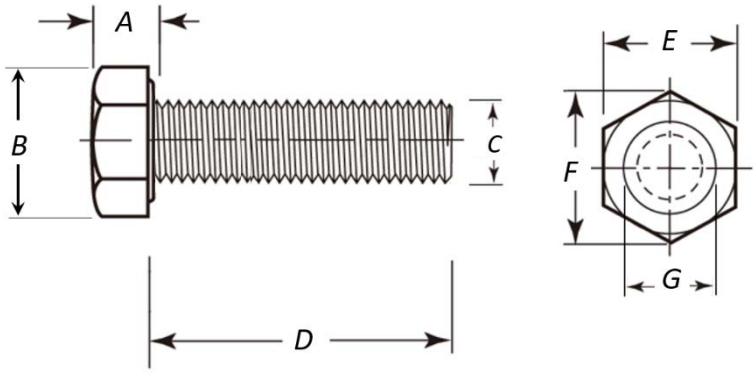
Instructions

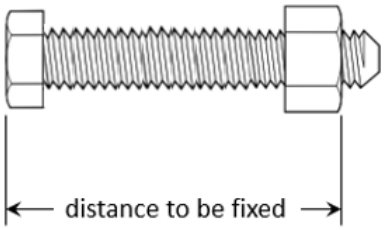
1. Measure parts of the hexagonal head bolt and its nut given to you with vernier caliper. Then, fill the table with your results.

Parameter	Vernier Caliper (mm)
A	
B	
C	
D	
E	
F	
G	



2. According to your student number, determine X*. Then fix the distance between head and nut of hexagonal head bolt to "X" with vernier caliper. If it is not possible, fix it to the closest value to "X" that you can measure.

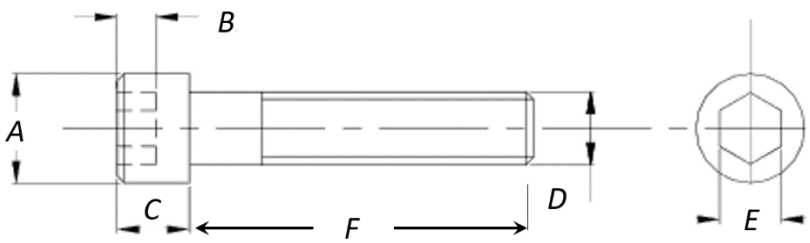
Value (mm)



Note that;
**X=(first <u>two number</u> of your student number). (last <u>two number</u> of your student number) mm*
For example;
Student number=130412019
X=13.19 mm

3. Dimensions of an allen bolt can be specified as below. Measure parts of the allen bolt given to you with vernier caliper. Then, fill the table with your results.

Parameter	Vernier Caliper (mm)
A	
B	
C	
D	
E	
F	



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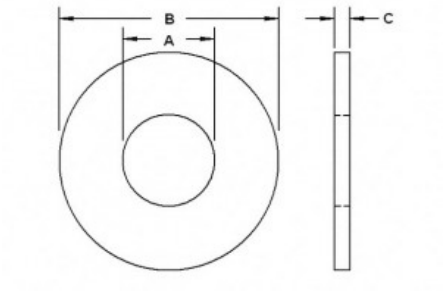
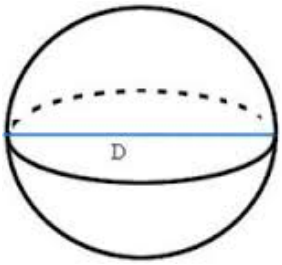
4. Measure the specified dimensions of a plain washer with vernier caliper. Then, fill the table with your results.

Parameter	Vernier Caliper (mm)
A	
B	
C	



5. Measure the diameter of spherical ball three times. Then, fill the table with your results.

No.	Vernier Caliper (mm)
1st	
2nd	
3rd	



Homeworks

1. In introduction section, briefly describe purpose of the experiment.
2. In method section, briefly describe measurement procedure of micrometer.
3. In results section, calculate the volume of hexagonal head bolt and nut that you measured at Instruction 1.
4. In results section, include a photo of fixed hexagonal head bolt and nut at Instruction 2.
5. In results section, calculate the total surface area of allen bolt that you measured at Instruction 3.
6. In results section, calculate the total surface area of plain washer that you measured at Instruction 4.
7. In results section, calculate the volume of spherical ball by considering the average value of your three diameter measurement at Instruction 5.
8. In conclusion section, comment on precision and usage of micrometer.
9. In conclusion section, comment on how you fixed bolt and nut exactly to “X” value at Instruction 2. If you could not fix it to exact “X” value, describe the reason.
10. In conclusion section, comment on your diameter measurement at Instruction 5. Is there any difference between three measurements? Why such differences occurs and how you can solve this problem? Compare micrometer and vernier caliper (the results in “Experiment 1”) results of your spherical ball diameter measurement.

* *You can access report format from website lcetin.github.io*