



**CE 181103**

**1<sup>st</sup> Semester  
Computer Science  
Engg**

***EGD***  
**Conic Sections**

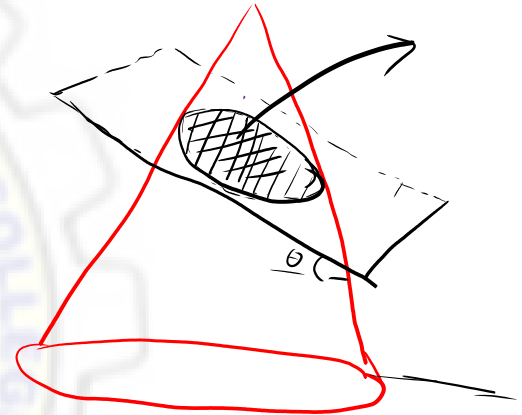
**Introduction**

Prepared By,  
**ARINDOM DAS**  
Assistant Professor  
Dept. of Civil Engineering  
(Bineswar Brahma Engineering College)

Conic section:  $\rightarrow$  (Section of a cone)

\* How a conic section is obtain ?

$\rightarrow$  By intersecting a cone with a 2-D plane



⊛ 4 types of section

$\rightarrow$  Circle

$\rightarrow$  Ellipse

$\rightarrow$  Parabola

$\rightarrow$  Hyperbola

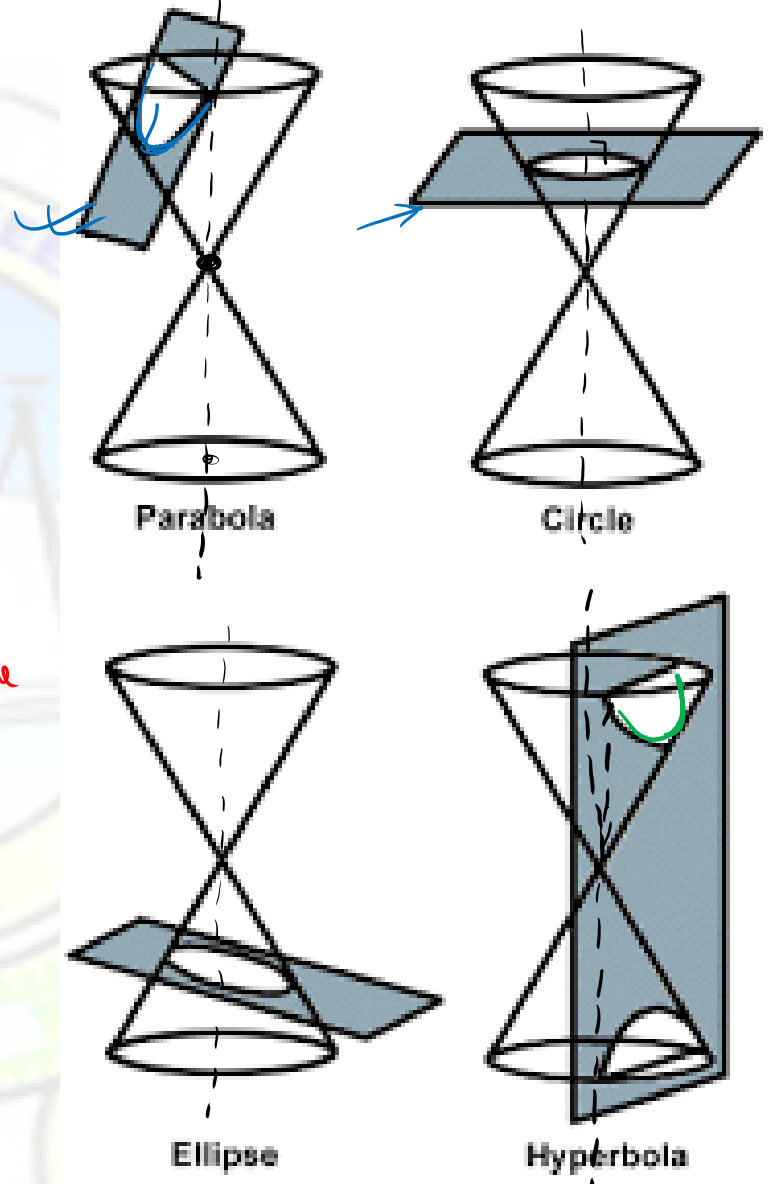


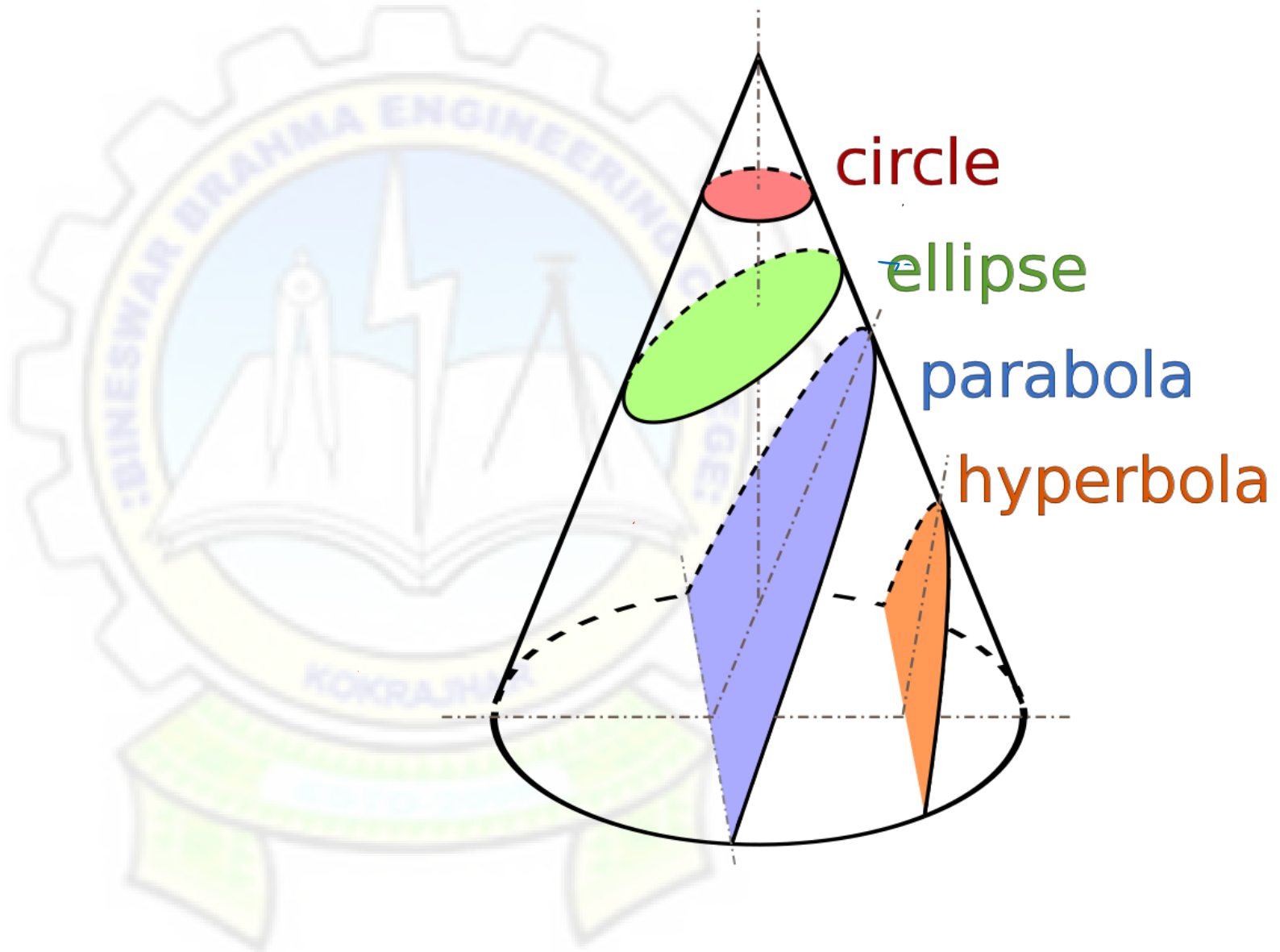
Circle  $\rightarrow$  is obtained by intersecting the cone by a plane  $\perp$  to the axis of cone.

Parabola  $\rightarrow$  is obtained by cutting a cone with a plane such that it cuts one of the generator

Ellipse: is obtained by cutting a cone with a plane such that the plane cuts all the generator and plane is inclined to the axis of cone

Hyperbola: Plane is parallel to the axis.





## \* Conic section:

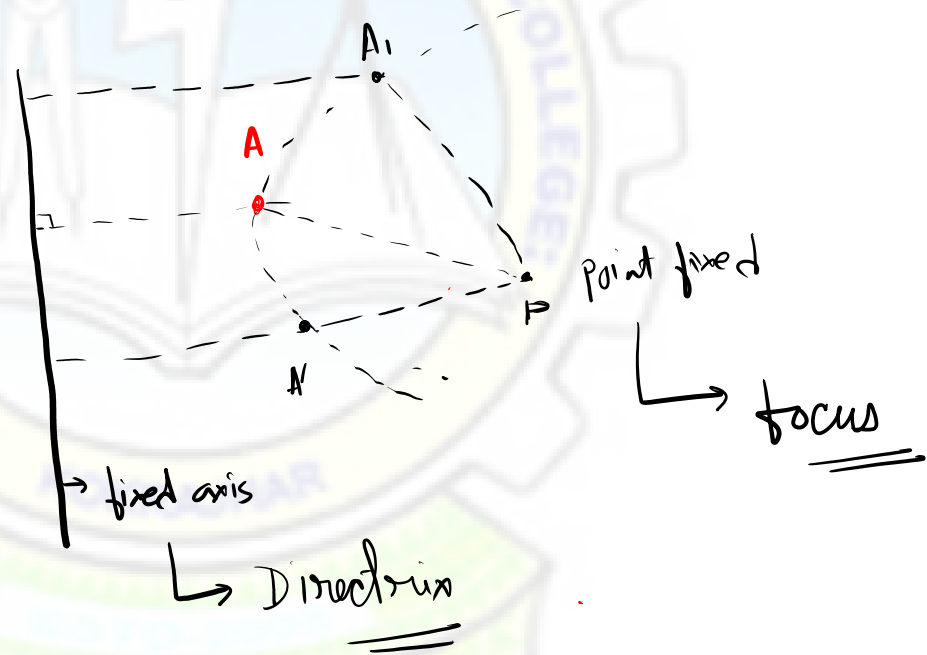
↳ Locus of a point moving in a plane such that the ratio of its distance from a fixed point to its dist from a fixed axis remains constant.

Eccentricity



ratio =

$$\frac{\text{dist of } A \text{ from fixed point}}{\text{dist of } A \text{ from fixed axis}} = \text{const}$$



Focus → the fixed point

Directrix → fixed axis

\* Eccentricity ('e')

$$e = \frac{\text{Dist of any point on the curve from the focus}}{\text{Dist of the same point on the curve from directrix}}$$

⊗

Case I

$$e = 0$$

Circle

Case II

$$0 < e < 1$$

Ellipse

Case III

$$e = 1$$

Parabola

Case IV

$$e > 1$$

Hyperbola

⊗



Direction



A

90°

B

Vertex

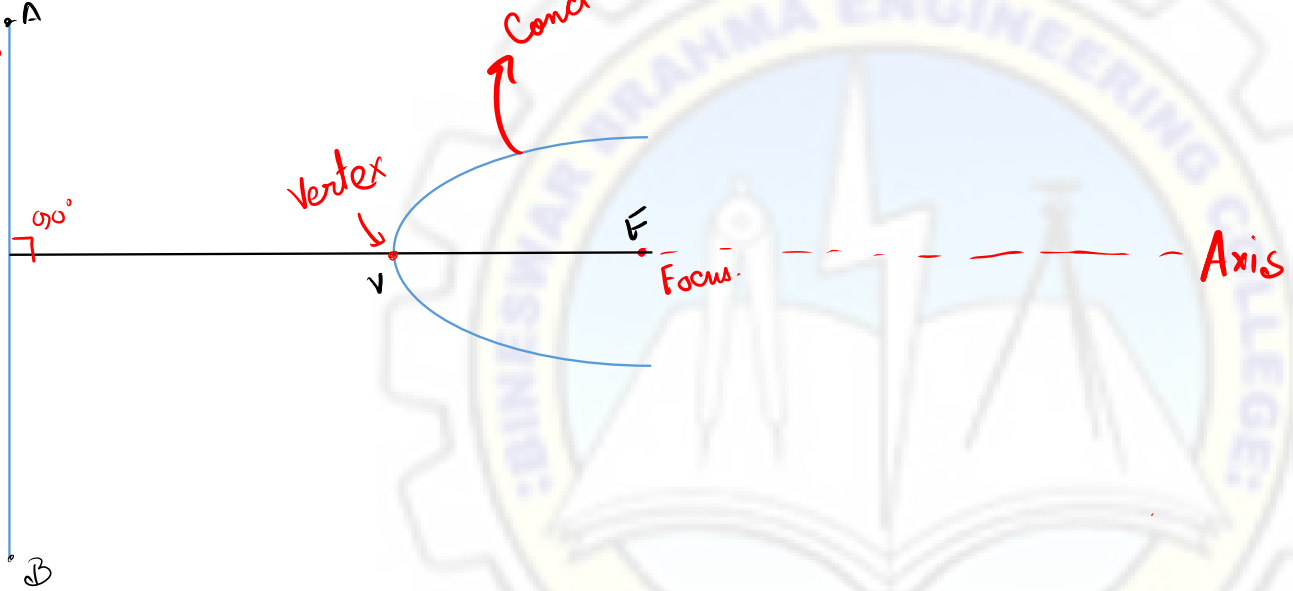
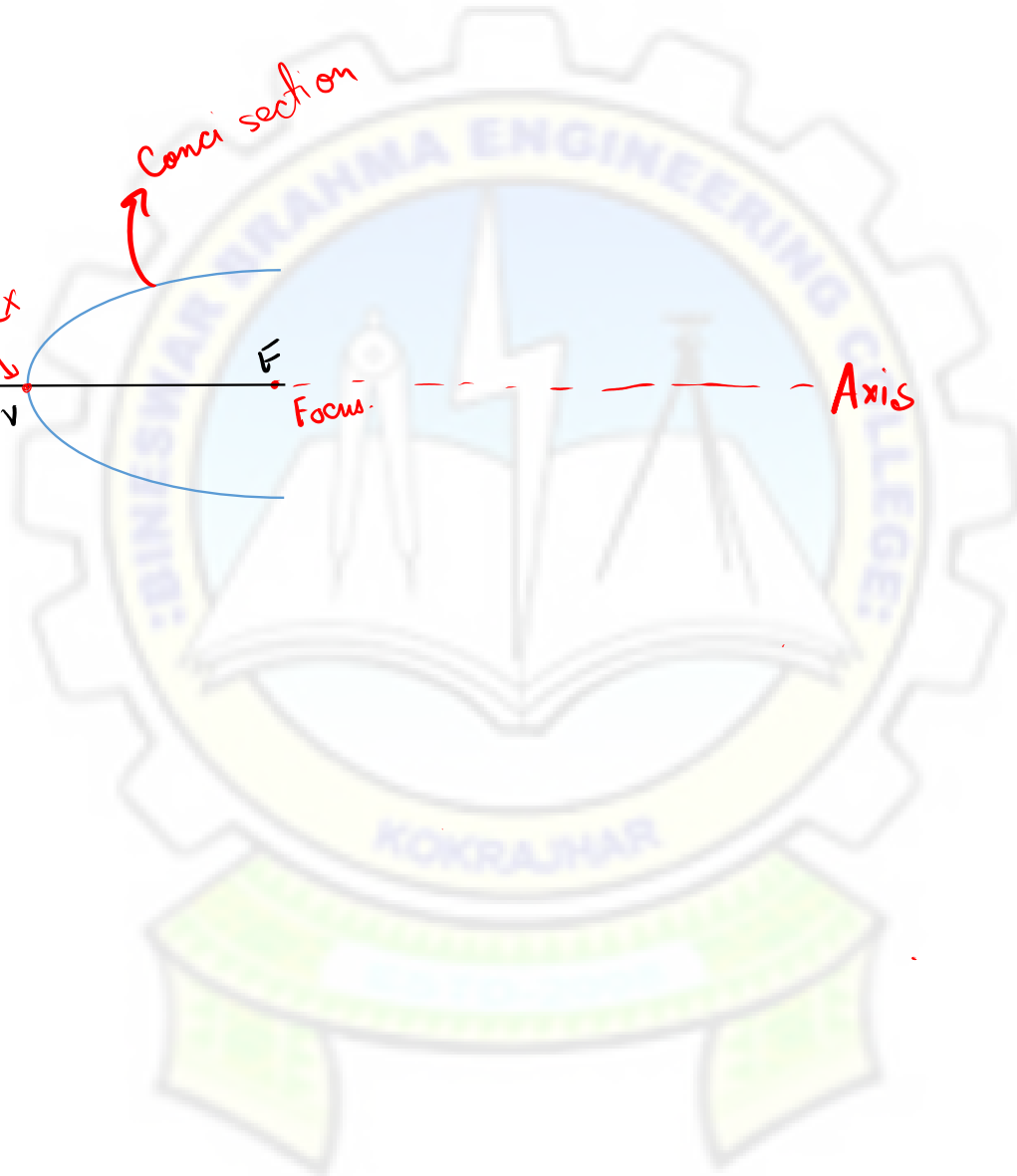
V

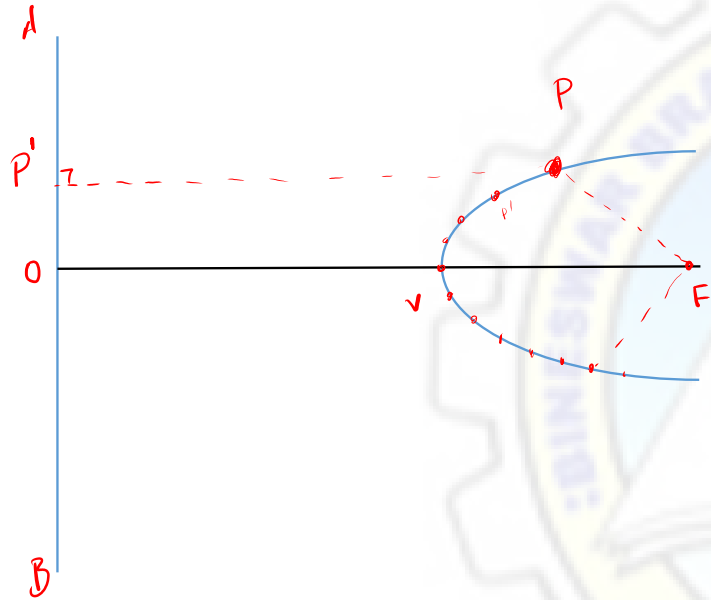
Conic section

F

Focus

Axis





$$\frac{PF}{PP'} = e = \frac{VF}{OV}$$

$$e = \frac{2}{3}$$





Focus  $\rightarrow$  the fixed point

Directrix  $\rightarrow$  fixed axis

\* Eccentricity ('e')

$e = \frac{\text{Dist of any point on the curve to focus}}{\text{Dist of any point on the curve to directrix}}$

