

## EVALUACIÓN DEL SEMESTRE 2019-1

$$\text{TAREAS. (1)} = 10\%$$

$$\text{SERIES (4)} = 40\%$$

$$\text{EXÁMENES PARCIALES (3)} = 50\%$$


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$$100\%$$

EXENTOS DE EXAMEN FINAL

\* PROMEDIO SEMESTRA  $\geq 8.0$ 

\* TODOS LOS PARCIALES APROBADOS

↓ 50%

$$\text{EF} = 50\%$$


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$$100\%$$

## CALENDARIO

1<sup>er</sup> EXAMEN PARCIAL - CAP. 1 y 2 - 27/09

2<sup>o</sup> EXAMEN PARCIAL - CAP. 3 — 25/10

3<sup>er</sup> EXAMEN PARCIAL - CAP 4. — 22/11

EN EL LABORATORIO DE CÓMPUTO

$$F\left(x, y, \frac{dy}{dx}, \frac{d^2y}{dx^2}, \dots\right) = 0 \quad \text{Leibnitz.}$$

$$F(x, y, y', y'', \dots) = 0$$

$$F(x, y, \dot{y}, \ddot{y}, \dots) = 0 \quad \text{Newton}$$


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ED { "Ecuaciones Diferenciales Ordinarias"  $F(x, y, y', y'') = 0$   $f(x) = y(x)$   
 CAP. 1, 2, 3  $F(t, x, x', x'') = 0$   $f(t) = x(t)$   
 v.i. v.i.

"Ecuaciones en Derivadas Parciales"  $F\left(x, y, z, \frac{\partial z}{\partial x}, \frac{\partial z}{\partial y}, \frac{\partial^2 z}{\partial x^2}, \dots\right) = 0$   $f(x, y) = z$   
 CAP 4  $z(x, y)$   
 der. más v.i.

	CURSO	VIDA REAL
EDO	75%	10%
EDP	25%	90%

orden de  
una ED.

CAP. 3.

- primer  
orden

CAP. 1

$$F(x, y, \frac{dy}{dx}) = 0$$

$$F(x, y, z, \frac{\partial z}{\partial x}, \frac{\partial z}{\partial y}) = 0$$

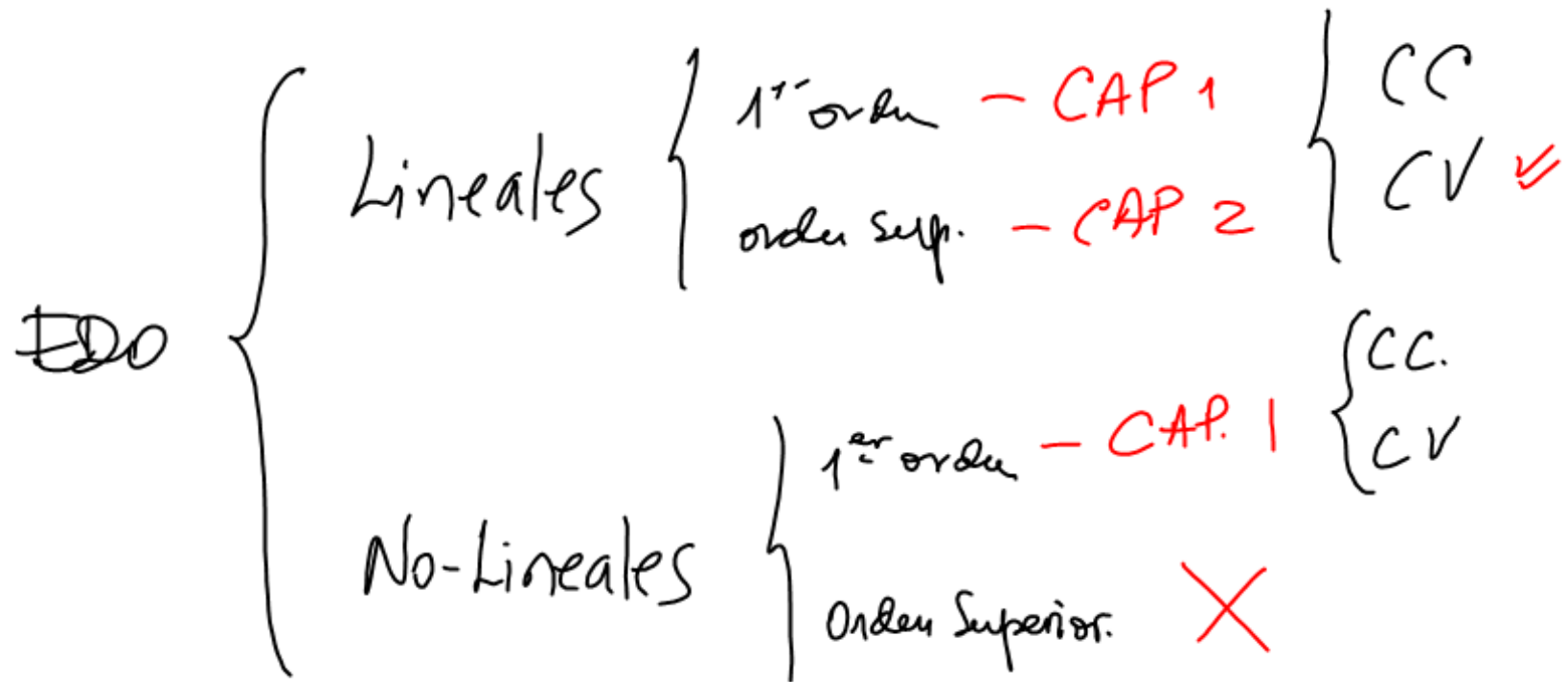
- orden superior  
a uno

$$F(x, y, \frac{dy}{dx}, \frac{d^2y}{dx^2}, \frac{d^3y}{dx^3}, \dots) = 0$$

$$F(x, y, z, z'_x, z'_y, z''_{xx}, z''_{xy}, \dots) = 0$$

(CAP. 2)

"El orden de ED será  
definido por el orden  
de la derivada de mayor  
orden"



# LA ECUACIÓN DIFERENCIAL LINEAL

$$a_0(x) \frac{d^n y}{dx^n} + a_1(x) \frac{d^{n-1} y}{dx^{n-1}} + \dots + a_{n-1}(x) \frac{dy}{dx} + a_n(x) y = Q(x)$$

FORMA GENERAL EDOL

$$\text{EDOL} \left\{ \begin{array}{l} \text{HOMOGÉNEA} \rightarrow Q(x) = 0 \\ \text{No-HOMOGÉNEA} \rightarrow Q(x) \neq 0 \end{array} \right.$$

$$\frac{d^2 y}{dx^2} + 5 \frac{dy}{dx} + 6y = 0 \quad \text{EDOL H. (2)}$$

$$\frac{d^2 y}{dt^2} = -g \quad \text{EDOL NH (2)}$$

$$m \frac{d^2 s}{dt^2} = -ks \Rightarrow m \frac{d^2 s}{dt^2} + ks = 0$$

$$\frac{dx}{dt} = v_0 \cos(4t) \quad \text{EDOL NH (1)}$$

# EDOL

$$a_0(x) \frac{d^n y}{dx^n} + a_1(x) \frac{d^{n-1} y}{dx^{n-1}} + \dots + a_{n-1}(x) \frac{dy}{dx} + a_n(x) y = Q(x)$$

EDOL {  
 coeficientes constantes  $\forall a_i(x) = k_i$   
 $i = 0 \dots n$   
 coeficientes variables

	cc	cv
H		
NH		

EDOL (orden superior) CV  $\begin{Bmatrix} H \\ NH \end{Bmatrix}$  X

# SOLUCIONES EDO.

$$L \begin{cases} SG(1) \\ SP(\infty) \end{cases}$$

$$NL \begin{cases} \textcircled{1} \begin{cases} SG(1) \\ SP(\infty) \end{cases} \\ \textcircled{2} \begin{cases} SG(1) \\ SP(\infty) \\ SS(\#) \end{cases} \end{cases}$$

SOLUCIÓN GENERAL.

$$\frac{d^2 y}{dt^2} = -g \quad \text{EJEMPLO (2) NH.}$$

$$d\left(\frac{dy}{dt}\right) = -g dt$$

$$\int d\left(\frac{dy}{dt}\right) = -g \int dt$$

$$\frac{dy}{dt} + C_1 = -g[t + C_2]$$

$$\frac{dy}{dt} = -gt + (-gC_2 - C_1)$$

$$\frac{dy}{dt} = -gt + C_0$$

$$dy = -gt dt + C_0 dt$$

$$\int dy = -g \int t dt + C_0 \int dt$$

$$y + C_3 = -g\left(\frac{t^2}{2} + C_4\right) + C_0(t + C_5)$$

$$y = -\frac{g}{2}t^2 + C_0 t + (-gC_4 + C_0 C_5 - C_3)$$

$$y = -\frac{g}{2}t^2 + C_0 t + C_{20} \quad \text{SOL. GEN.}$$

$$\frac{d^2 y}{dt^2} = -g \quad \text{Ecuación (2) N.H.}$$

$$y = -\frac{g}{2} t^2 + C_{10} t + C_{20} \quad \begin{cases} y(0) = 2.0 \\ y'(0) = 0 \end{cases}$$

$$\rightarrow \frac{dy}{dt} = -gt + C_{10} \quad y'(0) \Rightarrow 0 = -g(0) + C_{10}$$

$$\boxed{C_{10} = 0}$$

$$y = -\frac{g}{2} t^2 + (0) + C_{20} \quad y(0) \Rightarrow 2 = -\frac{g}{2} (0)^2 + C_{20}$$

$$\boxed{y = -\frac{g}{2} t^2 + 2}$$

SOLUCIÓN  
PARTICULAR

$$\boxed{C_{20} = 2}$$