

Lit Review:

Andy - Fabrication

Charlie - Design & Report

Vaibhav - Design & Report

Vicky - Actuation

Week 1 (7-13 ) - Design, Actuation and Verification (MEMS)

Week 2 (14-20) - Design finalization and Fabrication. (CAD Model and FEA Sim)

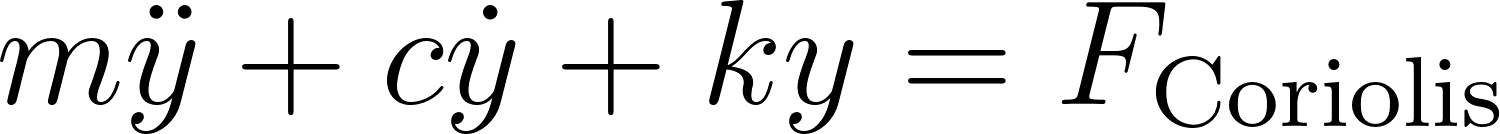
Week 3 (21- 27) - Fabrication and Report. (Post Processing and Report)

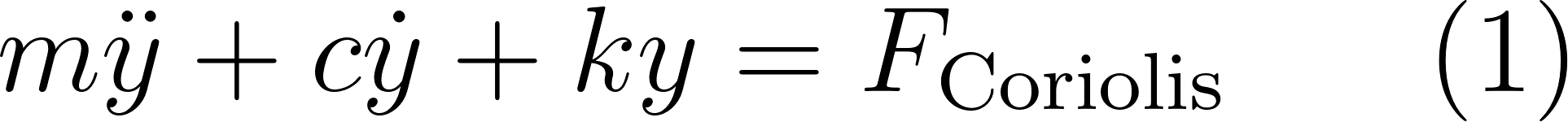
Next Meeting: Wednesday 4 pm (Paper Review and Preliminary Design)

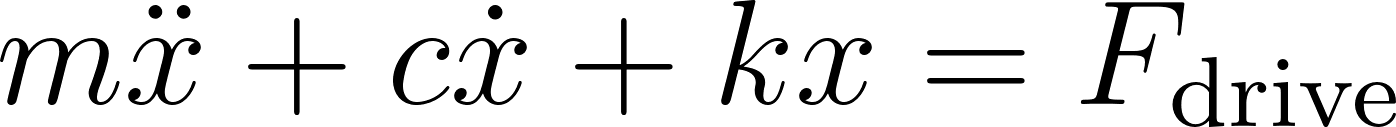
Next Meeting: Sat 1 pm

Next Meeting: Wednesday 4 pm 4/18

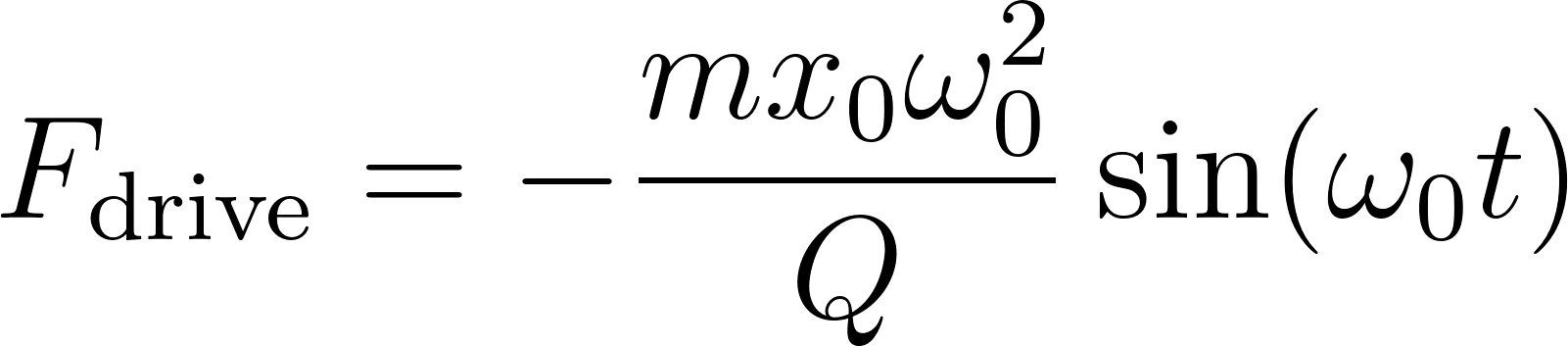
**ROUGH WORK:  
The equations with LaTex code:**

[](https://www.codecogs.com/eqnedit.php?latex=m%5Cddot%7By%7D%20%2B%20c%5Cdot%7By%7D%20%2B%20ky%20%3D%20F_%7B%5Ctext%7BCoriolis%7D%7D#0)

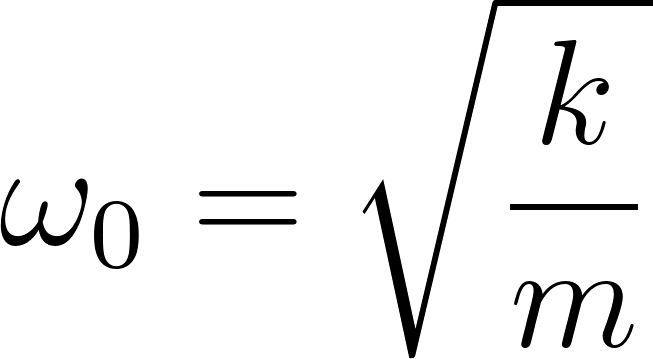
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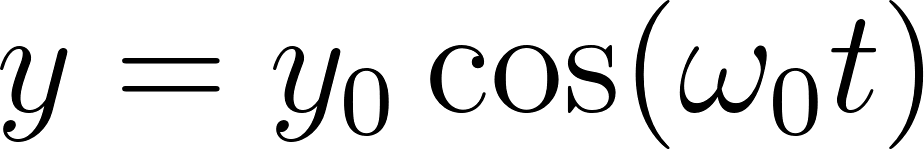
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m\ddot{x} + c\dot{x} + kx = F\_{\text{drive}}

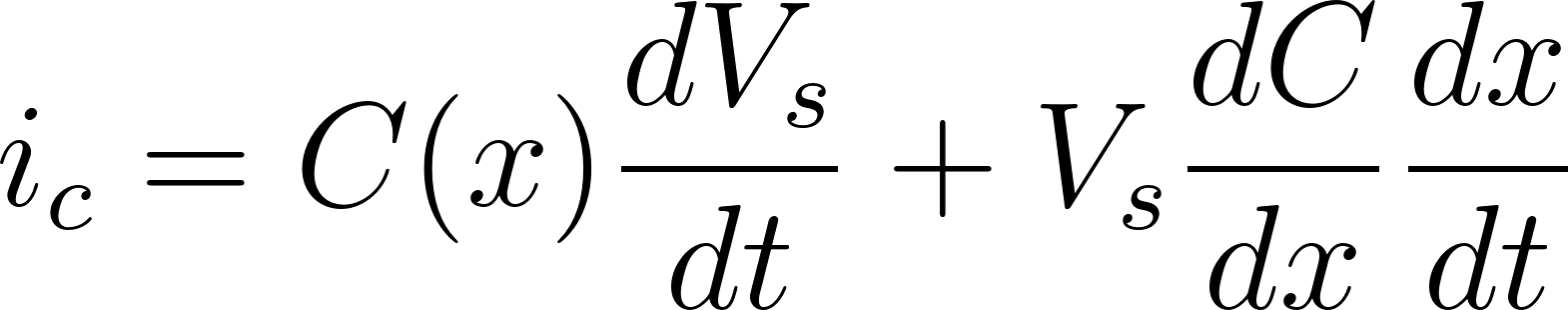
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F\_{\text{drive}} = -\frac{m x\_0 \omega\_0^2}{Q} \sin(\omega\_0 t)

[](https://www.codecogs.com/eqnedit.php?latex=%5Comega_0%20%3D%20%5Csqrt%5Cfrac%7Bk%7D%7Bm%7D#0)

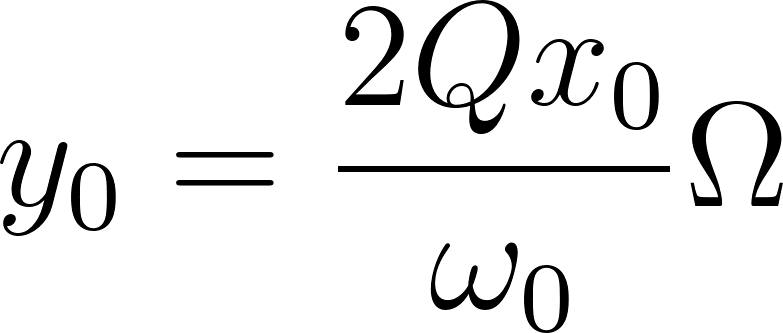
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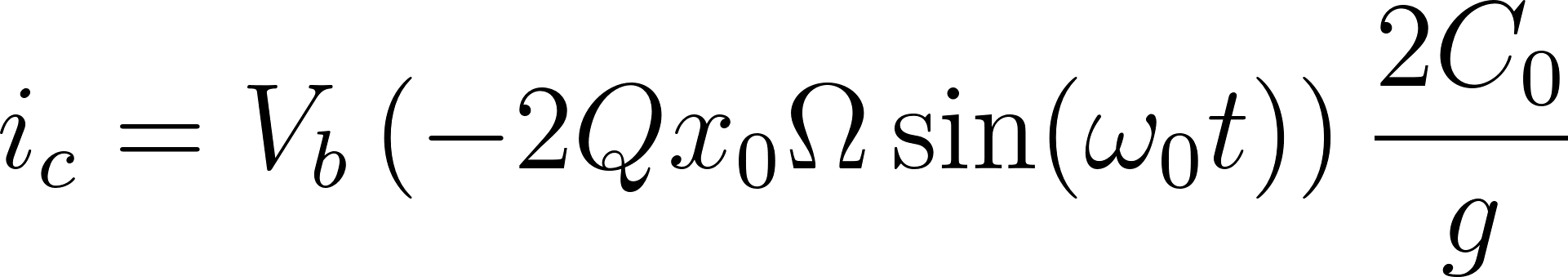
y = y\_0 \cos(\omega\_0 t)

[](https://www.codecogs.com/eqnedit.php?latex=i_c%20%3D%20C(x)%20%5Cfrac%7BdV_s%7D%7Bdt%7D%20%2B%20V_s%20%5Cfrac%7BdC%7D%7Bdx%7D%20%5Cfrac%7Bdx%7D%7Bdt%7D#0)

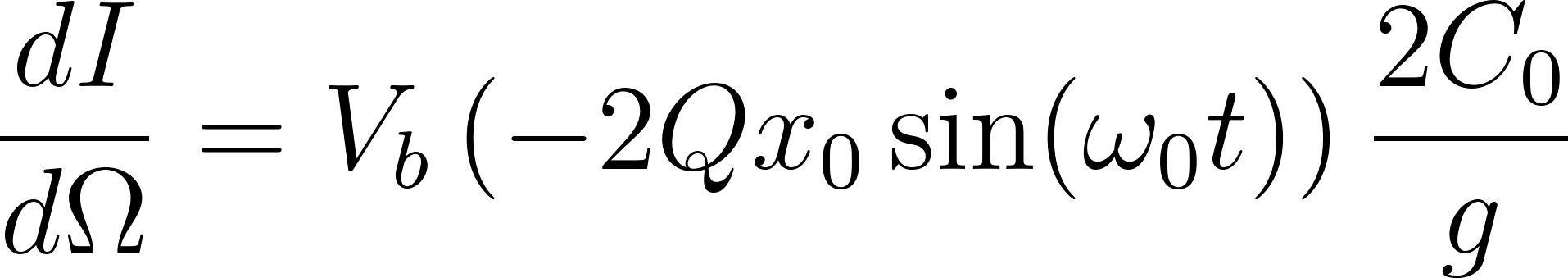
i\_c = C(x) \frac{dV\_s}{dt} + V\_s \frac{dC}{dx} \frac{dx}{dt}

y\_0 = frac{2Qx\_0 }{\omega\_0}\Omega

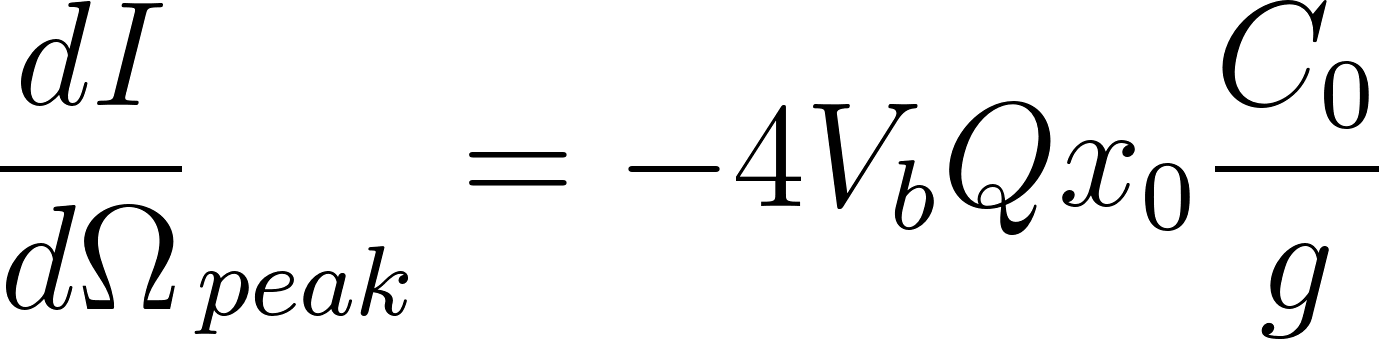
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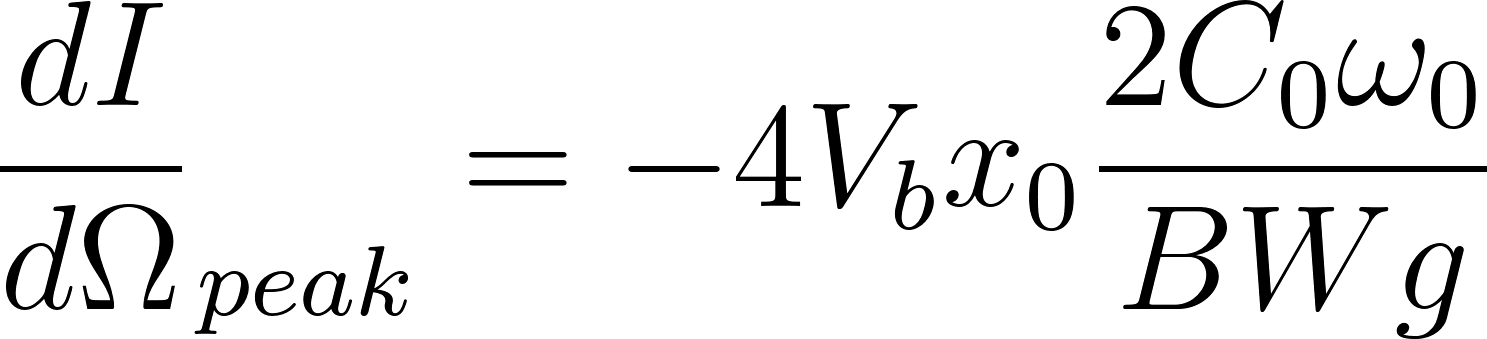
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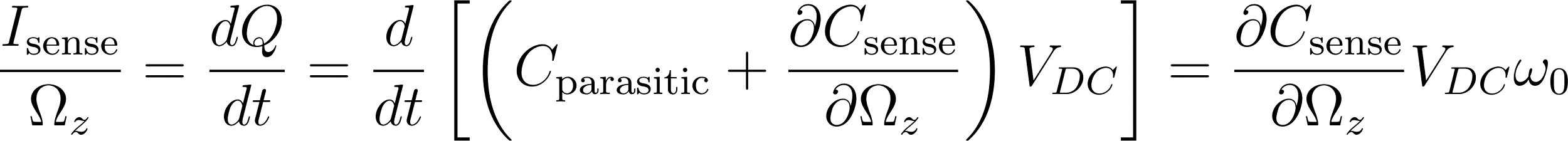
i\_c = V\_b \left(-2 Q x\_0 \Omega \sin(\omega\_0 t)\right) \frac{2 C\_0}{g}

[](https://www.codecogs.com/eqnedit.php?latex=%5Cfrac%7BdI%7D%7Bd%5COmega%7D%20%3D%20V_b%20%5Cleft(-2%20Q%20x_0%20%5Csin(%5Comega_0%20t)%5Cright)%20%5Cfrac%7B2%20C_0%7D%7Bg%7D#0)

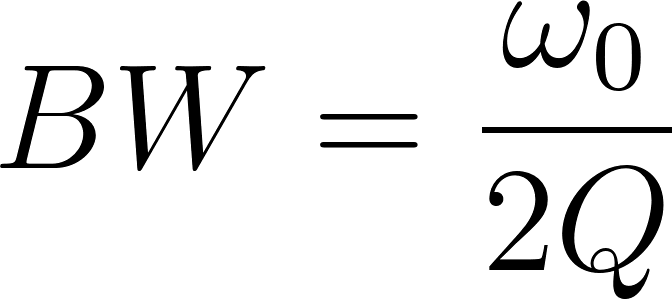
\frac{dI}{d\Omega} = V\_b \left(-2 Q x\_0 \sin(\omega\_0 t)\right) \frac{2 C\_0}{g}

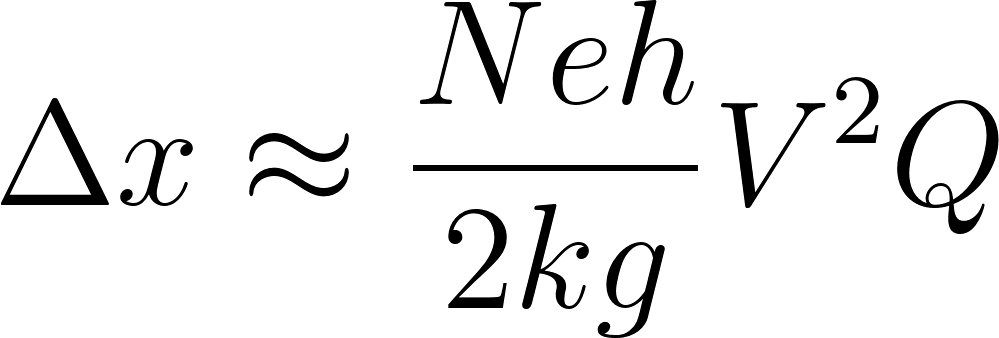
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[](https://www.codecogs.com/eqnedit.php?latex=%7B%5Cfrac%7BdI%7D%7Bd%5COmega%7D%7D_%7Bpeak%7D%20%3D%20-4V_bx_0%20%5Cfrac%7B2%20C_0%5Comega_0%7D%7BBWg%7D#0)

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\frac{I\_{\text{sense}}}{\Omega\_z} = \frac{dQ}{dt} = \frac{d}{dt} \left[ \left( C\_{\text{parasitic}} + \frac{\partial C\_{\text{sense}}}{\partial \Omega\_z} \right) V\_{DC} \right] = \frac{\partial C\_{\text{sense}}}{\partial \Omega\_z} V\_{DC} \omega\_0

[](https://www.codecogs.com/eqnedit.php?latex=BW%20%3D%20%5Cfrac%7B%5Comega_0%7D%7B2Q%7D#0)

[](https://www.codecogs.com/eqnedit.php?latex=%5CDelta%20x%20%5Capprox%20%5Cfrac%7BNe%20h%7D%7B2kg%7D%20V%5E2Q#0)

\Delta x \approx \frac{Ne h}{2kg} V^2Q