



*Escola Politécnica da Universidade de São Paulo
Departamento de Engenharia Mecânica*

PME-3211 – Mecânica dos Sólidos II

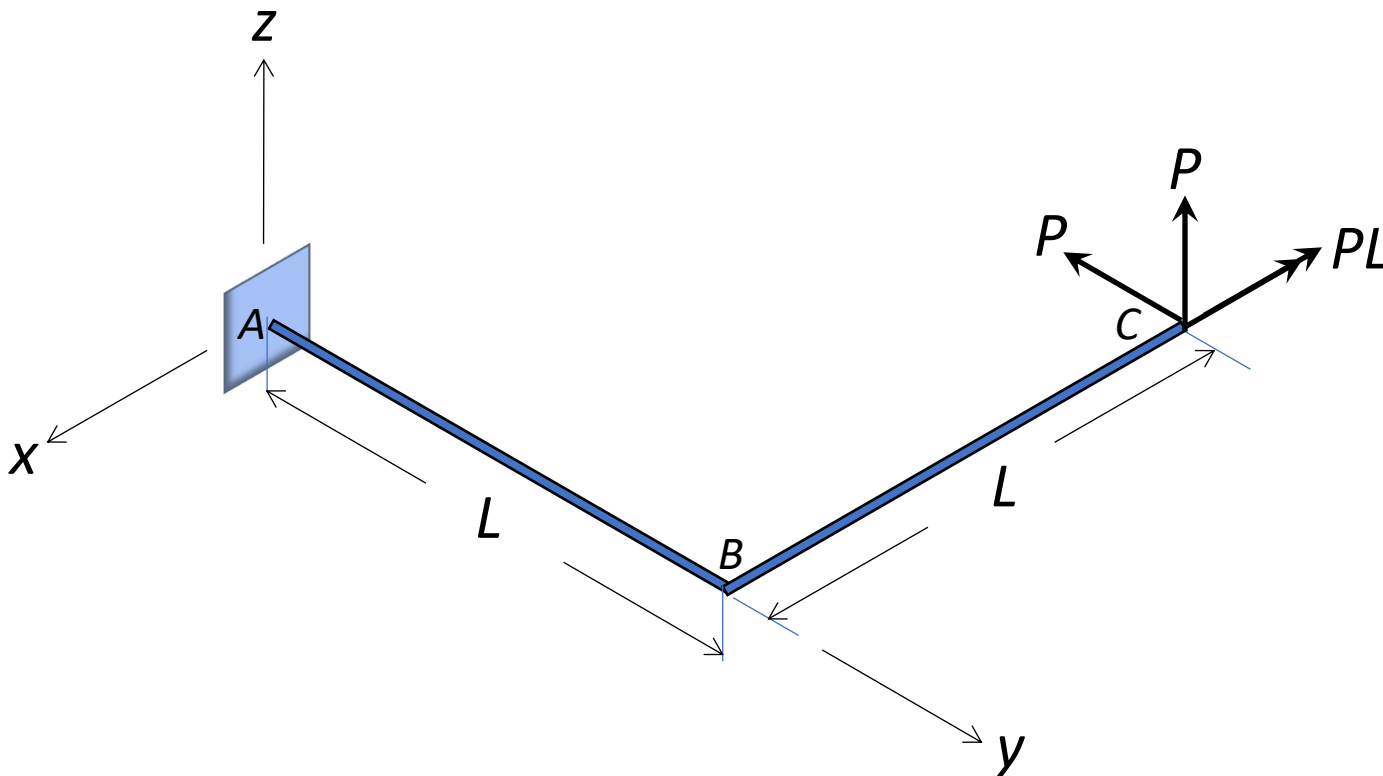
Aula #01

Prof. Dr. Clóvis de Arruda Martins

05/08/2025

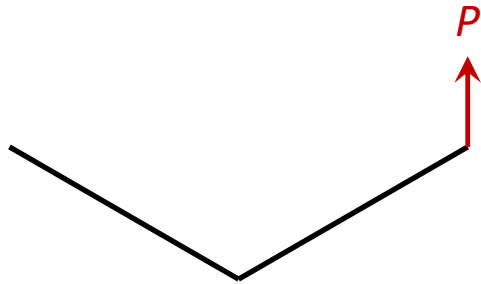


Esforços solicitantes em estruturas tridimensionais

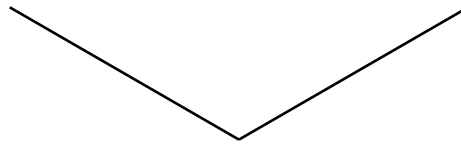




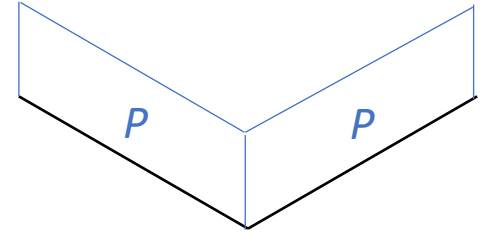
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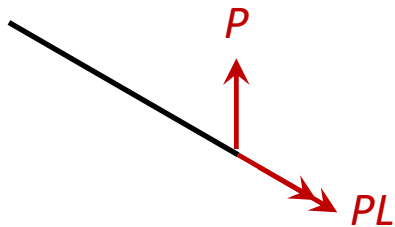
N



V
- no plano da força
- no sentido do eixo
cartesiano

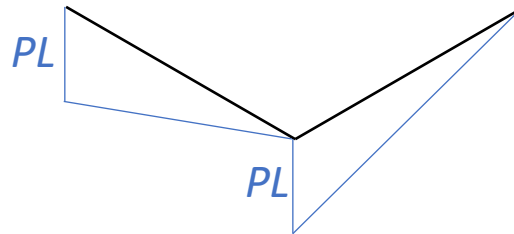


Transporte

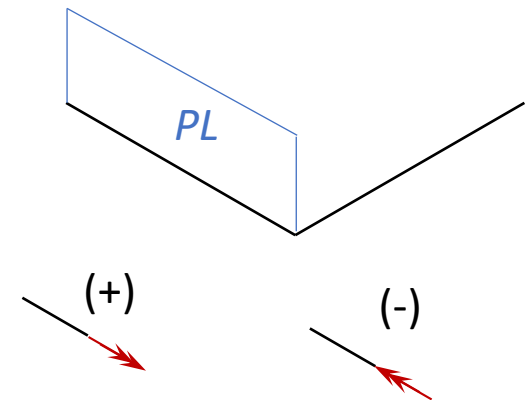


M

- no plano de flexão
- no lado tracionado da viga

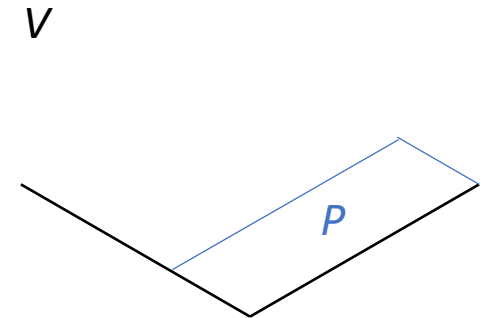
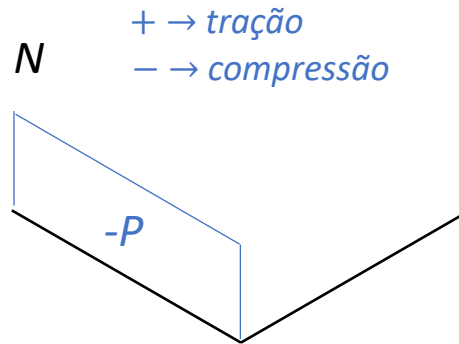
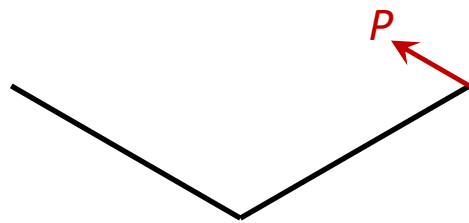


T

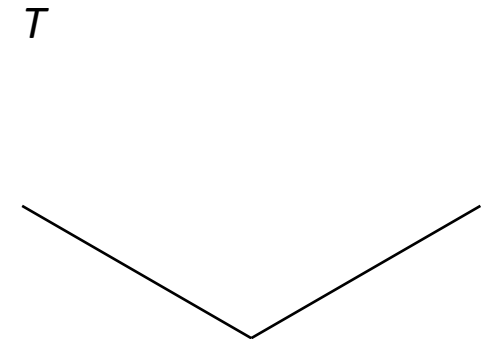
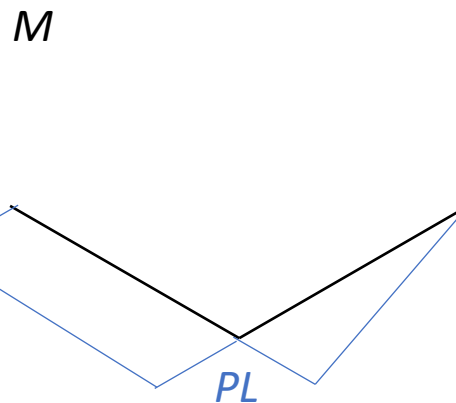
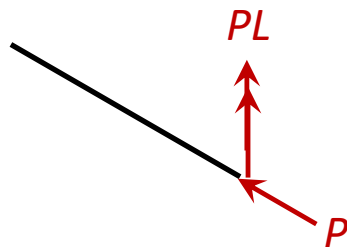




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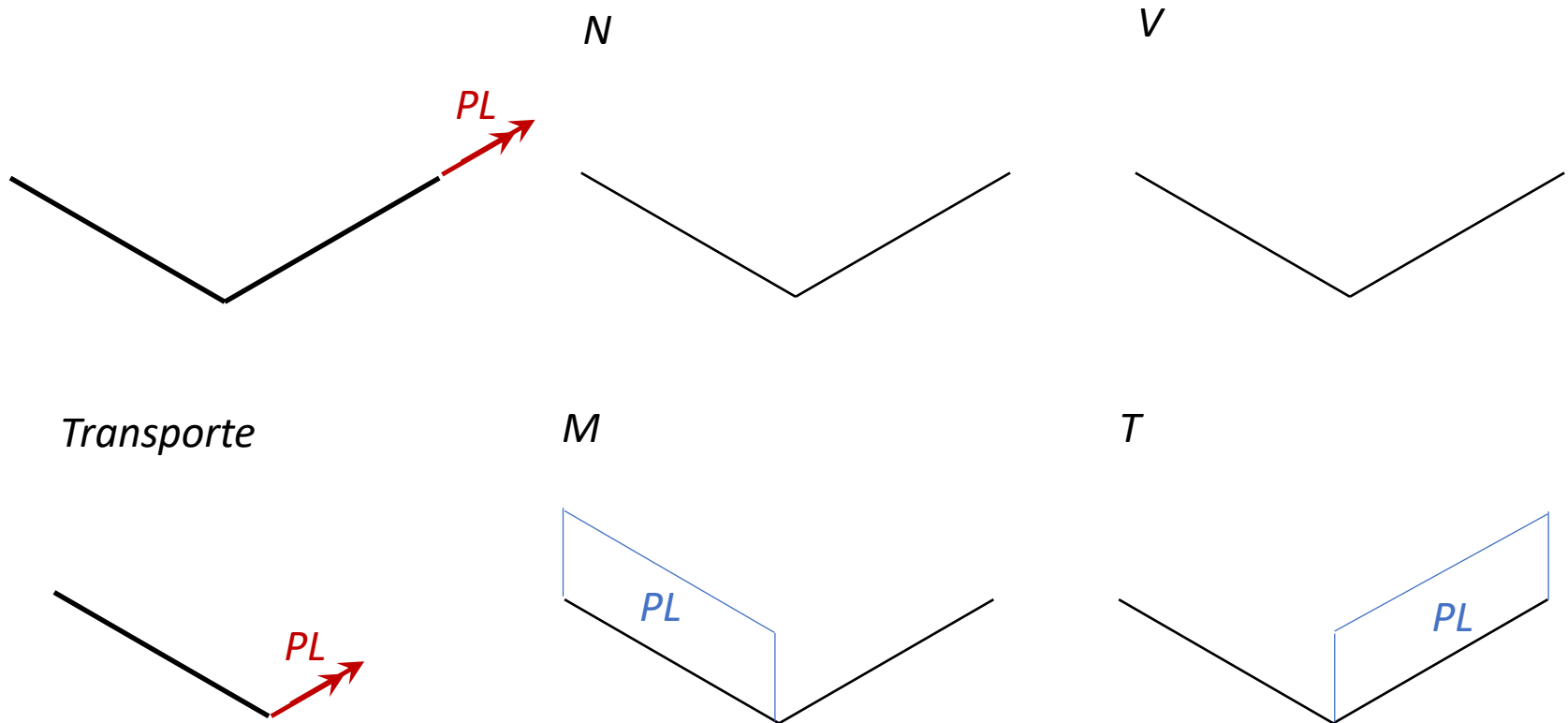


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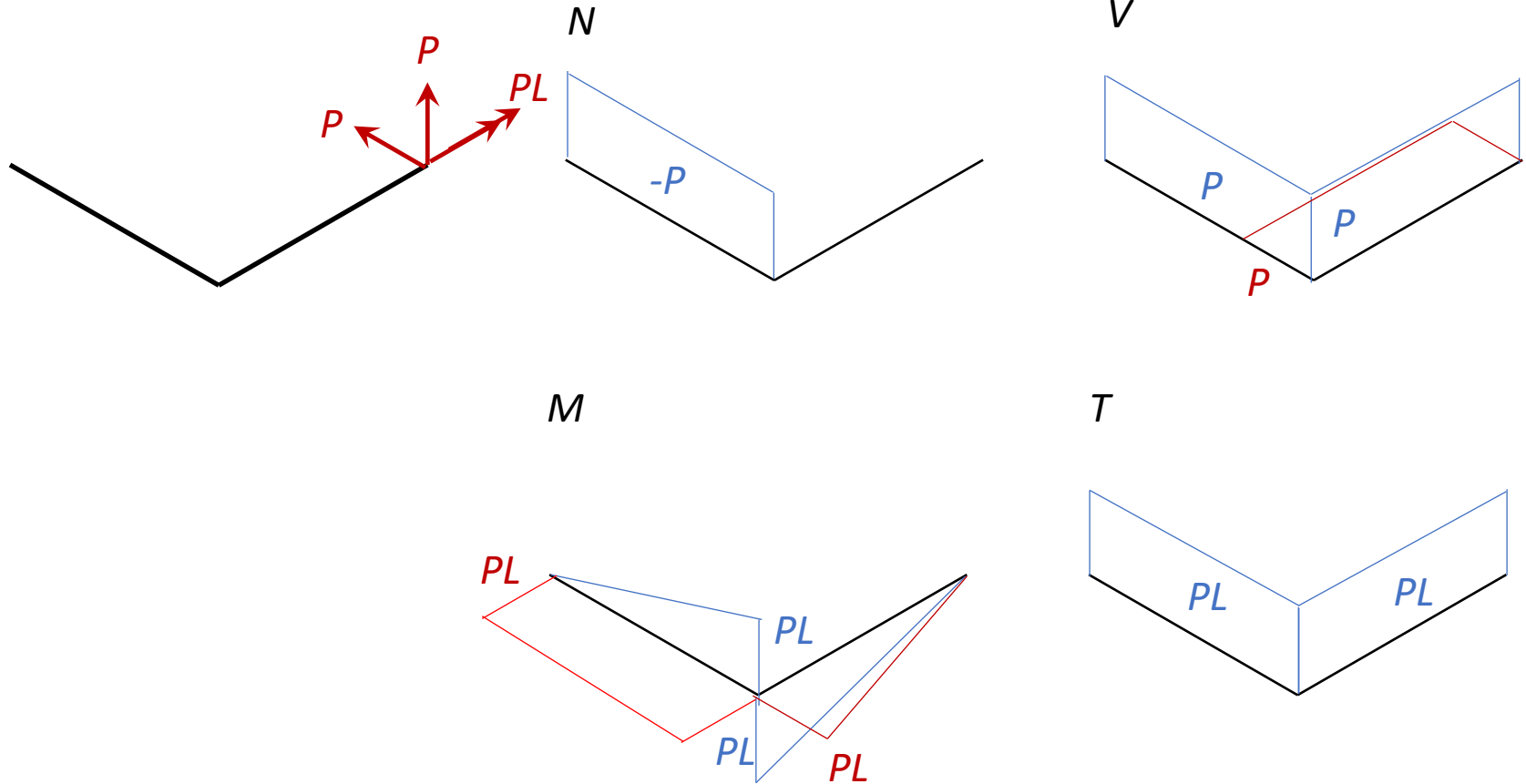


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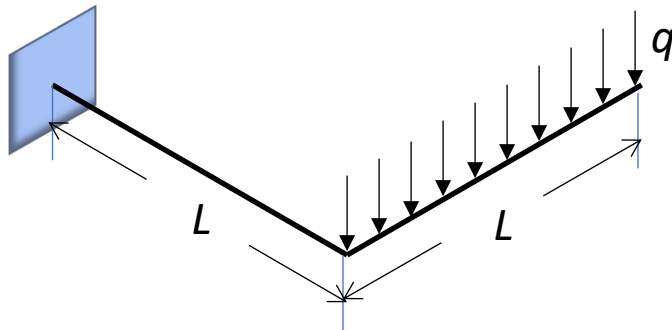


Superposição de efeitos

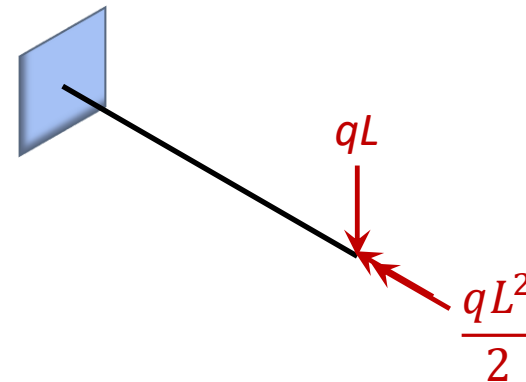




Força distribuída



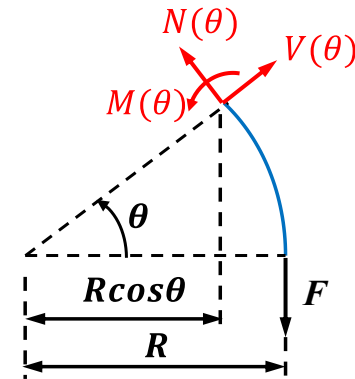
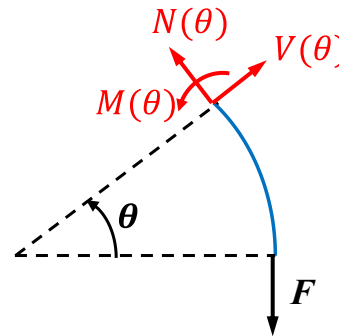
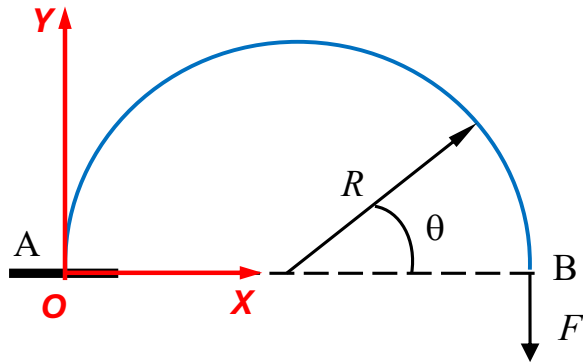
Transporte





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Estrutura em arco



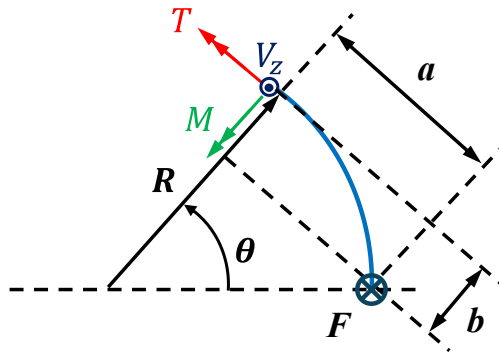
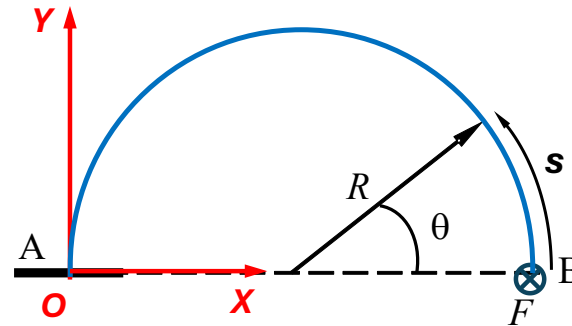
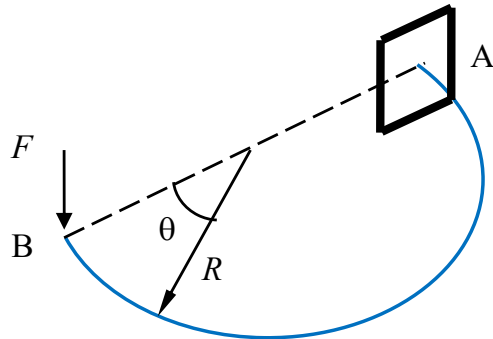
$$N(\theta) = F \cos \theta$$

$$V(\theta) = F \sin \theta$$

$$M(\theta) = FR(1 - \cos \theta)$$



Estrutura em arco



$$V_z(\theta) = F$$

$$M(\theta) = Fa = FR \sin \theta$$

$$T(\theta) = Fb = FR(1 - \cos \theta)$$

$$a = R \sin \theta$$

$$b = R(1 - \cos \theta)$$