Knowns: $m_c = 0.599 kg;\ m_b = 0.066 kg;\ \Delta t_b = 0.16 \sec;$

$$\vec{v}_{bi} = \frac{\Delta \vec{x}_b}{\Delta t_b} = \frac{x_f - x_i}{\Delta t_b} = \frac{0.313 - 0.566}{0.16} = -1.58125 \frac{m}{s}$$

Conservation of momentum:

$$\sum \vec{p}_i = \sum \vec{p}_f \Rightarrow \vec{p}_{bi} + \vec{p}_{ci} = \vec{p}_{bf} + \vec{p}_{cf} \Rightarrow m_b \vec{v}_{bi} + m_c \vec{v}_{ci} = m_b \vec{v}_{bf} + m_c \vec{v}_{cf} \Rightarrow m_b \vec{v}_{bi} = \left(m_b + m_c\right) \vec{v}_f$$

Note: $\vec{v}_{ci} = 0$ & $\vec{v}_{cf} = \vec{v}_{bf} = \vec{v}_f$

$$\Rightarrow \vec{v}_f = \frac{m_b \vec{v}_{bi}}{m_b + m_c} = \frac{\left(0.066\right)\left(-1.58125\right)}{0.066 + 0.599} = -0.15694 \frac{m}{s} \approx -0.16 \frac{m}{s} \left(predicted\right)$$

$$\left(observed\right) \vec{v}_f = \frac{\Delta \vec{x}_c}{\Delta t_c} = \frac{x_{cf} - x_{ci}}{\Delta t_c} = \frac{0.267 - 0.306}{0.25} = -0.156 \frac{m}{s}$$

$$E_r = \frac{O - A}{A} \times 100 = \frac{\left(-0.15694 - \left(-0.156\right)\right)}{-0.156} \times 100 = 0.6001 \approx 0.60\%$$