$$\forall h \in \mathcal{U}, \quad \lim_{\lambda \to 0} \frac{f(u_0 + \lambda h) - f(u_0)}{\lambda} = \frac{d}{d\lambda} f(u_0 + \lambda h) \bigg|_{\lambda=0} = \boldsymbol{D} f(u_0) \cdot h \qquad \text{(A.7a)}$$