NO.
DATE / /

coherent, for,

① $Hom(\mathcal{F}, \mathcal{O}^{(k)})$ is coherent.

$$\mathcal{O}^{(r)} \longrightarrow \mathcal{O}^{(k')} \longrightarrow \mathcal{F} \longrightarrow 0$$

$$\Rightarrow \quad 0 \longrightarrow Hom(\mathcal{F}, \mathcal{O}^{(k)}) \longrightarrow Hom(\mathcal{O}^{(k')}, \mathcal{O}^{(k)}) \xrightarrow{\alpha} Hom(\mathcal{O}^{(r)}, \mathcal{O}^{(k)})$$

. Once we prove $Hom(\mathcal{O}^{(k')}, \mathcal{O}^{(k)})$ is coherent, then since α is sheaf morphism, by the theorem 14 above, $Hom(\mathcal{F}, \mathcal{O}^{(k)}) = \ker\alpha$ is coherent.

$Hom(\mathcal{O}^{(k')}, \mathcal{O}^{(k)}) \cong \mathcal{O}^{(kk')}$ is coherent.

② $Hom(\mathcal{O}^{(k)}, \mathcal{G})$ is coherent, since $Hom(\mathcal{O}^{(k)}, \mathcal{G}) \cong \mathcal{G}^{(k)}$ by $Hom_R(R, M) \cong M$.

③ From $\mathcal{O}^{(p)} \longrightarrow \mathcal{O}^{(q)} \longrightarrow \mathcal{F} \longrightarrow 0$, we get

$$0 \longrightarrow Hom(\mathcal{F}, \mathcal{G}) \longrightarrow Hom(\mathcal{O}^{(q)}, \mathcal{G}) \xrightarrow{\alpha} Hom(\mathcal{O}^{(p)}, \mathcal{G}).$$

$\Rightarrow$ Since $Hom(\mathcal{O}^{(q)}, \mathcal{G})$ and $Hom(\mathcal{O}^{(p)}, \mathcal{G})$ are coherent, and α is sheaf morphism, $\ker\alpha = Hom(\mathcal{F}, \mathcal{G})$ is coherent by 14 Theorem above again.