Put in $a = 2M_s G/c^2$

Then, $au = \frac{2M_s G}{rc^2}$

Consider the case of the earth. Assuming a circular orbit, we have

$$\frac{m_e v^2}{r} = \frac{m M_s G}{r^2}$$

or $$\boxed{v^2 = \frac{M_s G}{r}}$$

$$\therefore \quad au = 2\frac{v^2}{c^2} = 2\times\left(\frac{2\pi R_\oplus}{1 \text{ light year}}\right)^2$$

$$= 2\times\left(\frac{2\pi \times .93\times 10^8}{5.88\times 10^{12}}\right)^2 \simeq 2\times 10^{-8}.$$

$$\boxed{au\big|_{earth} \simeq 2\times 10^{-8}, \quad au\big|_{mercury} \simeq 5.1\times 10^{-8}}$$

Put in value for a in the orbit eqn $\Rightarrow$

$$\boxed{\left(\frac{du}{d\phi}\right)^2 + u^2 = \frac{2E}{L^2} + \frac{2M_s G}{L^2}u + \frac{2M_s G}{c^2}u^3}$$

Let us compare this with Newton's result:
Equation 1 of notes gives with $V(r) = -\frac{mM_s G}{r}$
and $m=1$