Observations of terrestrial exoplanets provide a unique statistical set that may improve our knowledge of their formation, structure as well as internal and orbital evolution. Close-in extrasolar planets are subjected to strong stellar tides, resulting in an extensive dissipation of mechanical energy (tidal heating), long-term orbital evolution and evolution of the rotational frequency. For the exoplanets on eccentric orbits, the traditional tidal theories predict locking into pseudo-synchronous spin states, for which the rotational frequency is slightly higher than the orbital frequency. Such predictions are, however, in contradiction with the observations of moons in the Solar system, and are a consequence of simplified rheological assumptions. Here, we focus on a numerical approach to the tidal evolution of planetary orbit and rotation in a single-planet system, assuming a Maxwell viscoelastic rheology. We find equillibrium spin states, including the spin-orbit resonances, and discuss their connection with the minima of tidal heating. Locking into a spin-orbit resonance results in an irregular insolation pattern and an unequal surface temperature distribution, affecting the internal dynamics of the planet. The second part of the thesis therefore deals with the evaluation of the surface temperature and the extension of a numerical model solving the heat diffusion equation. Finally, we briefly discuss the detectability of spin-orbit resonances, obliquity and thermal inertia of terrestrial exoplanets in their infrared light curves.