A class of non-stationary time series which are almost periodic is considered. Special cases include time series with almost periodic mean function and almost periodic covariance function. We consider the modeling of such processes and the estimation of the associated model parameters. Such a process has its spectral mass concentrated on lines parallel to the diagonal line of the spectral plane. Methods based on spectral estimation are used to estimate the support of the spectral lines. When the almost periodic mean function is modeled by a trigonometric series regression, consistent estimates for frequencies, amplitudes and phases of the regression are obtained when the noise process is non-stationary but with periodic covariance function. A class of non-homogeneous Poisson point process with almost periodic intensity function can be modeled similarly. These models are useful in the forecasting of future events.