


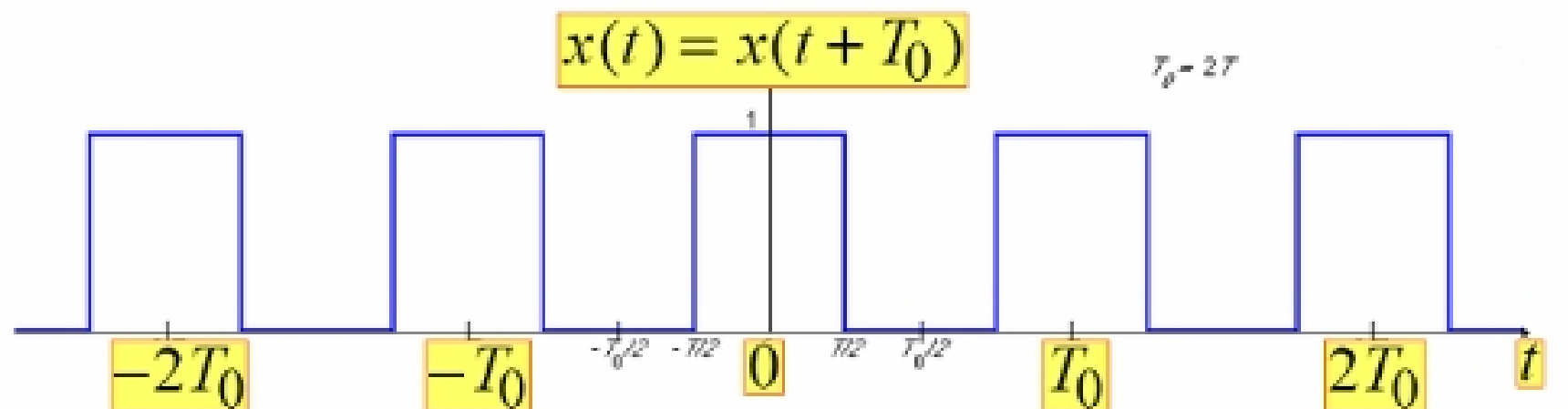
Continuous-Time Fourier Transform

- Objectives
 - Fourier Transform and the Spectrum
 - Properties of Fourier Transform Pairs
 - Table of Fourier Transform Properties and Pairs
- Reading Assignments
 - Chapter 11
 - Prepare: Chapter 13

Everything = Sum of Sinusoids

- One Square Pulse = Sum of Sinusoids
 - ??????????????
 - Finite Length
 - Not Periodic
- 
- Limit of Square Wave as Period \rightarrow infinity
 - Intuitive Argument

Fourier Series: Periodic $x(t)$



$$x(t) = \sum_{k=-\infty}^{\infty} a_k e^{j\omega_0 k t}$$

Fourier Synthesis

Fundamental Freq.

$$\omega_0 = 2\pi / T_0 = 2\pi f_0$$

$$a_k = \frac{1}{T_0} \int_{-T_0/2}^{T_0/2} x(t) e^{-j\omega_0 k t} dt$$

Fourier Analysis