

LECTURE 6

Fourier series for function on $-L$ to L
- periodic, period $2L$

Odd function $f(-x) = -f(x)$

→ sine series (all $a_n = 0$) with

$$b_n = \frac{2}{L} \int_0^L f(x) \sin \frac{n\pi x}{L} dx$$

Even function $f(-x) = f(x)$

→ cosine series (all $b_n = 0$)

Complex exponential series:

$$f(x) = \sum_{m=-\infty}^{\infty} c_m e^{im\pi x/L}$$

with

$$c_n = \frac{1}{2L} \int_{-L}^L e^{-in\pi x/L} f(x) dx$$

↑
complex conj.