



Kunnskap for en bedre verden

# TMA4130 MATEMATIKK 4N

Lecture 18: Fourier Analysis: Fourier Series

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# Important

If you develop respiratory symptoms, please stay home!

# Plan for today

1. We continue with the proof of Theorem 2 from Lecture 17
2. Convergence and Sum of a Fourier Series
3. Arbitrary period: From period  $2\pi$  to any period  $p = 2L$
4. Simplification: Even and odd functions

## References

The material of this lecture was based on Chapter 11.1 and 11.2 of the book

*Advanced Mathematical Engineering* by Erwin Kreyszig (John Wiley & Sons, 10th edition, 2011).

Moreover, we recommend the lecture notes by Morten Nome (in Norwegian), who taught the 2019 edition of this course. You can Morten's lecture notes on Fourier series here:

<https://www.math.ntnu.no/emner/TMA4125/2019v/notater/02-fourierrekker.pdf>.

The video series by Steve Brunton on Fourier analysis is very useful, see for example a video on Fourier Series and Gibbs Phenomena:

[https://www.youtube.com/watch?v=sSvj1nCC6\\_o](https://www.youtube.com/watch?v=sSvj1nCC6_o)

# Next Lecture

- ▶ We continue with Fourier Series (especially, half-range expansions)