THE CHINESE UNIVERSITY OF HONG KONG
Department of Mathematics
MMAT5030 (Spring 2016)
Harmonic Analysis
M10-12, 303 WHMY Building

Introduction

This is a mathematical introduction to Fourier series and Fourier transform. The following topics will be covered:

Trigonometric series, Fourier series of periodic functions, examples, pointwise and uniform convergence of Fourier series, L^2-convergence, completeness, Parseval's identity; equations of mathematical physics, boundary value problems and initial value problems, separation of variables; Fourier transform, inversion theorem.

Background: Calculus of one variables including differentiation and integration is required. Knowledge on infinite series of functions and uniform convergence is preferred. It will be recalled as we proceed.

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Tutor

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Text Book

- [F] *Fourier Analysis and Its Applications*, by G.B. Folland, The Wadsworth and Brooks/ Cole Mathematics Series, 1992.

References

- [T] *Fourier Series*, by G.P. Tolstov, Dover, New York 1972.
- [BS] *Introduction to Real Analysis*, by R.G. Bartle and D.R. Sherbert, John-Wiley and Sons, NY, 2000. This item is for background materials in Calculus.
- [SS] *Fourier Analysis, An Introduction*, by E.M. Stein and R. Shakarchi, Princeton University Press, New Jersey 2003.
- [K] *Fourier Analysis*, by T.W. Korner, Cambridge University Press, 1988.

Grade

- 20% Assignments
- 40% Midterm Examination
- 40% Final Examination