

Foreword

“... Both Mathematics and Physics are in a state of crisis in present days, from intellectual and social sides simultaneously. Both have much to contribute to each other’s disciplines, and I believe that a renewal of their traditional liaison would go far to cure at least the intellectual side of the malaise felt by workers in both disciplines...” — Robert Hermann in *Lectures in Mathematical Physics* — Vol. I & Vol. II.

My aim in this set of informal lecture notes on applied mathematical analysis is to present mathematical author’s original research material (Chaps. 3–9 and appendixes) revised and amplified of our two previous work on path-integrals in statistical and quantum physics and strongly focused at a pure and applied mathematical audience of readers.

We have a strong believe that mathematics students can find a source of inspiration to stimulate mutual interaction of their discipline and physics and thus, undertaking the reading of physics books, talking with physicists and try to read our previous two monographs in classical and quantum physics. The special emphasis in this supplementary volume 3 is on advanced mathematical analysis methods with its applications to solve partial differential equations in finite and infinite dimensions arising in applied settings. Another objective behind writing this set of author’s mostly original results in the form of lectures is the hope it could serve to show that the “aridity” and “sterility” that one finds in much modern “estimate mathematical analysis” can be conterweighted side by side by mathematical analysis formulae exactly used in the modern applications.

A word on the “methodology” in our set of lecture notes as a set of complementary notes we feel that the students should read the chapter with a pencil and paper at hand, after which they should make additional studies in the specific topic in the literature and thus present their studies in seminars to others students with all lectures mathematical details worked out.

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