

Preface

This text collects the material delivered in the course “Electromagnetic Fields” that I lectured starting from the academic year 2003–2004. This course was entitled with a value of five credits for the Science for Engineering Master Degree.

The book was first written with the intention of producing a text of a small size (compared to the reference book by G. Gerosa and P. Lampariello [1]) that would retain most of the important application topics and, at the same time, a rigorous analytic treatment of all the arguments exposed. This last requirement was particularly important as the Master Degree in Science for Engineering aimed at providing all students with a solid and rigorous background in physics and mathematics.

Over time I tried to improve the text usability, keeping the information self-consistent and reporting all the fundamental intermediate steps in analytical computations. I now believe that, because of its conciseness, this book can be a very useful aid for all Electromagnetism students.

My teaching experience makes me think that the objective was achieved, thanks both to an increasing lecturer effort and to a certain diligence required in the exam preparation, as students themselves recognized.

I found it very useful to make the text available on the Internet, for a long time. This approach permitted to implement real-time corrections and additions, it was very convenient for my students. Moreover, the interested reader can take a look at the personal webpage reported in https://web.uniroma1.it/dip_diet/users/frezza, which contains a considerable amount of informative and subsidiary material, as well as details on the topics of this text; everything was personally supervised either by me or by the talented colleagues and co-workers whom I also wish to thank.

The text starts with an introduction to the basic equations and theorems, followed by general and fundamental classic electromagnetic arguments whose value is both practical (for applications) and theoretical: plane waves, transmission lines, waveguides and Green’s functions.

I am beholden to my former student, and now Ph.D. in Engineering, Dr. Mauro Mineo, who helped me in composing the text with dedication and expertise, taking care of the successive LATEX versions. I am also deeply indebted to my Ph.D. student, Ing. Patrizio Simeoni, for his great help during the preparation of the English version: without such support, this book could not have been written.

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