Justesen, Jørn; Høholdt, Tom *** 1375.94001**

A course in error-correcting codes. 2nd edition.

EMS Textbooks in Mathematics. Zürich: European Mathematical Society (EMS) (ISBN 978-3-03719-179-8/hbk; 978-3-03719-679-3/ebook). x, 216 p. (2017).

Publisher's description: "This book, updated and enlarged for the second edition [first ed. Zbl 1048.94001], is written as a text for a course aimed at 3rd or 4th year students. Only some familiarity with elementary linear algebra and probability is directly assumed, but some maturity is required. The students may specialize in discrete mathematics, computer science, or communication engineering.

The book is also a suitable introduction to coding theory for researchers from related fields or for professionals who want to supplement their theoretical basis. The book gives the coding basics for working on projects in any of the above areas, but material specific to one of these fields has not been included. The chapters cover the codes and decoding methods that are currently of most interest in research, development, and application. They give a relatively brief presentation of the essential results, emphasizing the interrelations between different methods and proofs of all important results. A sequence of problems at the end of each chapter serves to review the results and give the student an appreciation of the concepts. In addition, some problems and suggestions for projects indicate direction for further work. The presentation encourages the use of programming tools for studying codes, implementing decoding methods, and simulating performance. Specific examples of programming exercises are provided on the book's home page."

I think it's useful to have a look at the chapter headings:

Ch. 1: Block Codes for Error Correction. Ch. 2: Finite Fields. Ch. 3: Communication Channels and Error Probability. Ch. 4: Reed-Solomon Codes and Their Decoding. Ch. 5: Cyclic Codes. Ch. 6: Frames. Ch. 7: Maximum Likelihood Decoding and Convolutional Codes. Ch. 8: Combinations of Several Codes. Ch. 9: Decoding Reed-Solomon and BCH Codes. Ch. 10: Iterative Decoding. Ch. 11: Algebraic Geometry Codes.

Appendixes: A Some Results from Linear Algebra. B Communication Channels. C Tables of minimal polynomials. D Solutions to Selected Problems. Index.

Well written and highly recommendable. *Olaf Ninnemann (Berlin)*