References for M641

Our primary reference for M641 will be the assigned textbook, *Principles of Applied Mathematics: transformations and approximations*, 2nd Edition, by James P. Keener, but we'll have several additional references as well. My goal in providing this list is not to suggest that students get copies of these books, but rather to give students an idea of where my lectures are coming from. Since the book by Hunter and Nachtergade is available for free on line, I do suggest students download a copy of that (see the link on our course web site).

Matrix Theory and Finite Dimensional Vector Spaces

1. *Finite Dimensional Vector Spaces*, by Paul R. Halmos

Absolutely classic text dating originally to 1942 upon which most modern discussions of linear algebra are at least partially based.

2. *Perturbation Theory for Linear Operators*, by Tosio Kato

The first chapter of this book is a great introduction to linear spaces and linear operators.

Analysis and Functional Analysis

1. *Principles of Mathematical Analysis*, by Walter Rudin.

Known as "baby Rudin," this is the classic undergraduate reference on analysis.

2. *Real Analysis: Modern Techniques and Their Applications*, by Gerald B. Folland.

Currently, the Texas A&M math department uses this text for our first-year graduate sequence in analysis, M607-M608. It's a bit of a slog in places, but a dependable reference.

Applied Analysis References

1. *Methods of Mathematical Physics, Vol. I*, by Richard Courant and David Hilbert.

This is a classic early reference in applied analysis, and one of the books Keener has leaned on heavily.

2. *Analysis for Applied Mathematics*, by Ward Cheney

This is a well-known applied analysis textbook with a strong emphasis on the analysis. We will use it as a reference for several topics from analysis that are omitted from Keener's text.

3. *Applied Analysis*, by John Hunter and Bruno Nachtergade.

Relatively new, this book has the enormous benefit of being available free on line:

www.math.ucdavis.edu/~hunter/book/pdfbook.html

Ordinary Differential Equations References

1. *Ordinary Differential Equations*, by Jack K. Hale.

Published in 1969, this book seems to have gone out of style, but I haven't yet identified a better reference for graduate ODE. Might not be the sort of book you'd take to the beach.

Partial Differential Equations References

1. *Partial Differential Equations*, by Lawrence C. Evans

This has become a fairly standard book for a first-year sequence in PDE, and it's the book we use at A&M for M611-M612.

2. *Partial Differential Equations: Methods and Applications*, by Robert C. McOwen

This is another PDE reference that I've found quite useful.