

Partial Differential Equations

SOME REFERENCES

Math 642 Spring 2016

Jerry L. Kazdan

Basic general texts; beginning graduate level

Carrier, G. F. and Pearson, *Partial Differential Equations*, Academic Press, 1976. [Less theoretical, aimed at people trying to solve practical problems.]

Courant-Hilbert, *Methods of Mathematical Physics, Vol. I, II*, Wiley-Interscience, 1953, 1962. [Chapters 5 and 6 of Volume I and all of Volume II are relevant.]

DiBenedetto, E., *Partial Differential Equations*, Birkhäuser, 1995.

Evans, Lawrence C., *Partial Differential Equations*, in the series Graduate studies in mathematics, Second Edition v. 19, American Math. Society, 2010. ISBN: 978-0-8218-4974-3

John, F., *Partial Differential Equations*, 4th edition, Springer Applied Mathematics Series, 1982.

Jost, Jürgen, *Partial Differential Equations*, Springer-Verlag Graduate Texts in Mathematics, Vol. 214, 3rd Edition, 2013.

McOwen, R., *Partial Differential Equations, Methods and Applications*, Prentice-Hall, 1996

Renardy, Michael and Rogers, Robert C., *An Introduction to Partial Differential Equations*, New York: Springer-Verlag, 1993, Texts in Applied Mathematics; 13.

Strauss, Walter A., *Partial differential equations: An Introduction*, New York: Wiley, 1992. [For an advanced undergraduate course.]

More Advanced or Specialized

Aubin, Thierry, *Some Nonlinear Problems in Riemannian Geometry*, Springer-Verlag, 1998. This book also includes Aubin's older book *Nonlinear Analysis on Manifolds. Monge-Ampère Equations*, Springer-Verlag, published in 1982.

Bers, John, Schechter. *Partial Differential Equations*, Wiley- Interscience, 1964. Reprinted by the American Mathematical Society.

Chow, Lu, and Ni, *Hamilton's Ricci Flow*, AMS Graduate Studies in Mathematics) December 12, 2006

Gilbarg, D. and Trudinger, N., *Elliptic Partial Differential Equations of Second Order*, Springer-Verlag 2nd edition, 1983.

Jost, Jürgen, *Riemannian Geometry and Geometric Analysis*, Springer-Verlag 2006

Kazdan, Jerry L., *Applications of Partial Differential Equations to Some Problems in Differential Geometry*, Notes from Lectures in Japan, 1993.

<https://www.math.upenn.edu/~kazdan/japan/japan.pdf>

<https://www.math.upenn.edu/~kazdan/japan/japan2up.pdf>

Lions, J.L., *Quelques Méthodes de Résolution des Problèmes Limites, Non-Linéaires*, Dunod, 1969. [Presumes knowledge of basic linear theory. Emphasis on examples and techniques, not general theories.]

Mizohata, S., *The Theory of Partial Differential Equations*, translated from the Japanese, Cambridge University Press, 1973.

Morgan, J. & Tian, G. *Ricci flow and the Poincaré conjecture*, Clay Mathematics Monographs, vol. 3, American Mathematical Society, Providence, RI; Clay Mathematics Institute [2007], Cambridge, MA. MR2334563 (2008d:57020)

Morgan, J. & Tian, G., *The geometrization conjecture*, Clay Mathematics Monographs, vol. 5, American Mathematical Society, Providence, RI; Clay Mathematics Institute [2014] Cambridge, MA. MR3186136

Nirenberg, L., *Lectures on Linear Partial Differential Equations*, A.M.S., 1972.

Nirenberg, L. *Topics in Nonlinear Functional Analysis*, New York University Lecture Notes 1974. Published by American Mathematical Society (2001), ISBN-13: 978-0821828199

Protter, M. and Weinberger, H., *Maximum Principles in Differential Equations*, Prentice-Hall, 1967. [This has the best versions and most of the results. Very clearly written.]

Warner, F.W., *Foundations of Differential Manifolds and Lie Groups*, Scott-Foresman, 1971. Reprinted in the Springer-Verlag Graduate Text Series. [The last chapter has the simplest development of linear elliptic equations with smooth coefficients. Application to prove the Hodge theorem.]