

GEOMETRIC MEASURE THEORY

Summer Graduate School, MSRI/SLMath, June 8 to 18, 2026

PREREQUISITES

- [1] H. BREZIS, *Functional analysis, Sobolev spaces and partial differential equations*, Universitext, Springer, New York, NY, 2011, Chapter 3. ISBN 978-0-387-70913-0. [MR](#) [Zbl](#)
- [2] L. C. EVANS, *Partial differential equations*, 2nd ed., Graduate Studies in Mathematics **19**, American Mathematical Society, Providence, RI, 2010, Chapters 2 and 5. Third printing of 2nd edition, 2022. ISBN 978-0-8218-4974-3. [MR](#) [Zbl](#)
- [3] G. B. FOLLAND, *Real analysis: modern techniques and their applications*, 2nd ed., Pure and Applied Mathematics (New York), Wiley, New York, NY, 1999, Chapter 9. ISBN 0-471-31716-0. [Errata to printings 1–5](#). [Errata to printings 6+](#). [MR](#) [Zbl](#)
- [4] H. L. ROYDEN and P. FITZPATRICK, *Real analysis*, 5th ed., Pearson, London, England, 2023, Chapters 1–4, 7, 18–19, 9–12, 21–22. (4th ed.: Chapters 1–4, 7, 14–15, 17–22.) ISBN 0-02-404151-3. Chapter [equivalence chart](#) of editions 4 and 5. [MR](#) [Zbl](#)

MAIN REFERENCES

- [5] C. DE LELLIS, *Rectifiable sets, densities and tangent measures*, Zürich Lectures in Advanced Mathematics, European Mathematical Society, Zürich, Switzerland, 2008, Chapters 1, 2, and 4. ISBN 978-3-03719-044-9. [MR](#) [Zbl](#)
- [6] C. DE LELLIS, [Allard’s interior regularity theorem: an invitation to stationary varifolds](#), in *Nonlinear analysis in geometry and applied mathematics, part 2*, L. BIERI, P. T. CHRUSCIEL, T. C. COLLINS, and S.-T. YAU, eds., Harvard CMSA Series in Mathematics **2**, International Press, Somerville, MA, 2018, ISBN 978-1-57146-359-3, pp. 23–49. [MR](#) [Zbl](#)
- [7] G. DE PHILIPPIS, C. GASPARETTO, and F. SCHULZE, [A short proof of Allard’s and Brakke’s regularity theorems](#), *Int. Math. Res. Not.* **2024** (2024), no. 9, 7594–7613. [MR](#) [Zbl](#)
- [8] L. C. EVANS, Laplace’s equation, in *Partial differential equations*, Graduate Studies in Mathematics **19**, American Mathematical Society, Providence, RI, 2nd ed., 2010, Section 2.2. Third printing of 2nd edition, 2022. ISBN 978-0-8218-4974-3, pp. 19–42. [MR](#) [Zbl](#)
- [9] L. C. EVANS and R. F. GARIEPY, *Measure theory and fine properties of functions*, 2nd ed., Textbooks in Mathematics, CRC Press, Boca Raton, FL, 2025, Chapters 1, 2, and 3. ISBN 978-1-032-94644-3; 978-1-003-58300-4; 978-1-032-95055-6. [MR](#) [Zbl](#)
- [10] S. G. KRANTZ and H. R. PARKS, *Geometric integration theory*, Cornerstones, Birkhäuser, Boston, MA, 2008, ISBN 978-0-8176-4676-9. [MR](#) [Zbl](#)

ADDITIONAL MATERIAL

- [11] L. AMBROSIO, N. FUSCO, and D. PALLARA, *Functions of bounded variation and free discontinuity problems*, Oxford Mathematical Monographs, Oxford University Press, New York, NY, 2000, ISBN 0-19-850245-1. [MR](#) [Zbl](#)

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Bibliography by Guido De Philippis.

<https://library.slmath.org/bib/2026/bib-gmt2026.pdf>

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- [12] H. FEDERER, *Geometric measure theory*, Grundlehren der mathematischen Wissenschaften **153**, Springer, New York, NY, 1969. [MR](#) [Zbl](#)
- [13] M. GIAQUINTA, G. MODICA, and J. SOUČEK, *Cartesian currents in the calculus of variations, I: Cartesian currents*, Ergebnisse der Mathematik und ihrer Grenzgebiete. 3. Folge **37**, Springer, Berlin, Germany, 1998, ISBN 3-540-64009-6. [MR](#) [Zbl](#)
- [14] M. GIAQUINTA, G. MODICA, and J. SOUČEK, *Cartesian currents in the calculus of variations, II: Variational integrals*, Ergebnisse der Mathematik und ihrer Grenzgebiete. 3. Folge **38**, Springer, Berlin, Germany, 1998, ISBN 3-540-64010-X. [MR](#) [Zbl](#)
- [15] F. MAGGI, *Sets of finite perimeter and geometric variational problems: an introduction to geometric measure theory*, Cambridge Studies in Advanced Mathematics **135**, Cambridge University Press, Cambridge, England, 2012, ISBN 978-1-107-02103-7. [MR](#) [Zbl](#)
- [16] P. MATTILA, *Geometry of sets and measures in Euclidean spaces: fractals and rectifiability*, Cambridge Studies in Advanced Mathematics **44**, Cambridge University Press, Cambridge, England, 1995, ISBN 0-521-46576-1; 0-521-65595-1. [MR](#) [Zbl](#)
- [17] L. SIMON, *Lectures on geometric measure theory*, Proceedings of the Centre for Mathematical Analysis, Australian National University **3**, Australian National University, Centre for Mathematical Analysis, Canberra, Australia, 1983, ISBN 0-86784-429-9. [MR](#) [Zbl](#)