

## MATH 231A: 9 LECTURE REFERENCES

### 1. ESTIMATES FOR GENERAL ELLIPTIC EQUATIONS

- Our approach to general equations is the standard one of changing variables to flatten the boundary, and then subtracting off a constant coefficient elliptic equation on sufficiently small balls so one can boil things down to the constant coefficient Schauder estimates.

One can find a treatment of this material in Chapter 6 of [2], Chapter 6 of [4], and in Chapter 11 of Jost's book (on reserve in the library).

- Interpolation inequalities like the one in the notes is also standard. See Section 6.8 of [2] and Section 1.2.2 of [4].
- There is an alternative method in Chapter 3 of Lin's notes [3], and Chapter 3 of Giaquinta's notes [1], which is to work more directly with the general elliptic operator  $L$  and approximate the corresponding solution  $w$  by appropriately transformed (i.e. linearly transformed) harmonic functions. This method naturally extends to the case of  $C^0$  coefficients.

### REFERENCES

- [1] Giaquinta, Mariano **Introduction to regularity theory for nonlinear elliptic systems**. Lectures in Mathematics ETH Zürich. Birkhäuser Verlag, Basel, 1993. viii+131 pp.
- [2] Gilbarg, David; Trudinger, Neil S. **Elliptic partial differential equations of second order**. Reprint of the 1998 edition. Classics in Mathematics. Springer-Verlag, Berlin, 2001. xiv+517 pp.
- [3] Han, Qing; Lin, Fanghua **Elliptic partial differential equations**. Courant Lecture Notes in Mathematics, 1. New York University, Courant Institute of Mathematical Sciences, New York; American Mathematical Society, Providence, RI, 1997. x+144 pp.
- [4] Wu, Zhuoqun; Yin, Jingxue; Wang, Chunpeng **Elliptic & parabolic equations**. World Scientific Publishing Co. Pte. Ltd., Hackensack, NJ, 2006. xvi+408 pp.