
Project 2 (E) The method of subharmonic functions of Perron to solve the Dirichlet problem as in Gilbarg-Trudinger, Section 2.8. Due week 1.


Project 4 (I) $W^{2,p}$-estimates of solutions to linear uniformly elliptic equations as in Gilbarg-Trudinger, Sections 9.4 and 9.5. Due week 2.

Project 5 (D) $C^{1,\alpha}$ and $C^{2,\alpha}$ estimates for solutions of fully nonlinear uniformly elliptic equations as in Cabré and Caffarelli, Chapter 8, Sections 8.1 and 8.2. Due week 3.

Project 6 (E) Hopf formulas for Hamilton-Jacobi equations as in Evans’ book, Chapter 3.3 and Section 10.3.4. Due week 2.

Project 7 (E) Semiconcavity of solutions to Hamilton-Jacobi equations as in Bardi and Capuzzo-Dolcetta’s book, Chapters 2.4.2 and 2.5.1. See also Cannarsa and Sinestrari’s book. Due week 2.

Project 8 (D) Paper by Evans and Spruck, “Motion of level sets by mean curvature”. Due week 3.


Project 10 (E) $C^0$-estimates in Section 7 and necessary preliminaries in the paper by Ishii and Lions, “Viscosity solutions of...”. Due week 3.

Project 11 (I) 2nd derivative estimates for eqs of Monge-Ampère type as in Gilbarg-Trudinger, Section 17.6. See also Gutiérrez’ book, Chapter 4. Due week 3.


Notes: (E)=easy; (I)=intermediate; (D)=difficult.
For all projects students must write and submit a paper explaining in a concise and clear way all the important details in the project as well as the necessary background.