THE CHINESE UNIVERSITY OF HONG KONG
Department of Mathematics
MATH5022 Theory of Partial Differential Equations, 2nd Term 2016-17

Below are some recommendations for other PDE textbooks related to the course. Selection is neither meant to be complete or definitive, and they are only some books that I think would be helpful for your learning of the course.

- *Partial Differential Equations: An Introduction* by Walter A. Strauss. It is a complete undergraduate textbook, adopted widely for a first course in PDE for math majors. Quickly look through Chapter 6 (Harmonic Functions) and Chapter 7 (Green's Identities and Green's Functions).

- *Partial Differential Equations* by Fritz John. It seems the main undergraduate textbook at Courant Institute. The book contains a significant number non-trivial results, it covers many areas of PDEs and it is still neither too advanced nor too big. Read Section 4 of Chapter 4.

- *Partial Differential Equations* by Lawrence C. Evans. It is a classical well-known PDE textbook at the graduate level, offering a comprehensive survey of modern techniques in the theoretical study of PDE. Every graduate student in analysis should read it. If you have time, read carefully through Chapter 2.2 (Laplace's equation), Chapter 5 (Sobolev Spaces) and Chapter 6 (Second-Order Elliptic Equations). It is also useful and helpful to read Chapter 8 regarding the topic on *The Calculus of Variations*.

- *Elliptic Partial Differential Equations of Second Order* by David Gilbarg and Neil S. Trudinger. It contains the systematic development of the general theory of second order quasilinear elliptic equations and of the linear theory required in the process. Take a look at Chapter 1 for an introduction to the elliptic theory. You may be interested in Part I (Linear Equations) of the book, including Exercises after each chapter. Use the book as a solid reference, if it was difficult for you to read it.

- *Partial Differential Equations* by Jürgen Jost. It contains the most important methods and central results for the elliptic PDEs. Read Chapters 11-14 referred to as the auxiliary reading materials of the course.

- *Fully Nonlinear Elliptic Equations* by Luis A. Caffarelli and Xavier Cabré.

- *Shock Waves and Reaction-Diffusion Equations* by Joel Smoller. Look through ONLY Chapter 8 (Second-Order Linear Elliptic Equation) which contains a concise representation of the subject, particularly including the clear proof of existence due to Schauder.