Translator's Foreword

It is my great pleasure to present an English translation of *Essentials of Stochastic Processes* written by Professor Kiyosi Itô. It was almost half a century ago when the original Japanese version of this book was published by Iwanami Shoten. As it is mentioned by Professor Itô in the Author's Preface, I took up the translaton of Part II (Chapters 4 and 5 of the book) into English only a couple of years after the publication of the original with the urging of the late Professor Shizuo Kakutani of Yale University. I was a graduate student in mathematics at Yale at the time, trying to write a Ph.D. thesis under Professor Kakutani's supervision, and he probably thought that I should look into the possibility of working in the field of continuous parameter Markov processes, which was undergoing a rapid development at the time. No doubt, he felt that the best place to follow this development was to read the account by Professor Itô, who was one of the central figures spearheading this development. Professor Kakutani himself was very much interested in the materials contained in this book, and he thought there may be people around Yale and elsewhere in the United States who would benefit a great deal from learning the contents of this book, especially the part on diffusion processes. This was why he urged me to translate (rather than just read through) Part II of the book into English, and when I finished the translation, he decided to have it typed and copies mimeographed by a secretary of the Mathematics Department of Yale and put out as a part of the lecture note series circulated by the Department. I do not know how many copies of the translation were circulated in this manner, but I learned much later that there were a number of people, some of whom eventually became prominent probabilists, who have read the translation and benefitted from it. Although I ended up choosing a thesis topic in Ergodic Theory, a field related but not directly connected with the contents of this book, I certainly learned a great deal about Stochastic Processes in going through the book carefully in the process of translation.

A couple of years ago, Masatoshi Fukushima approached me and asked whether I would be interested in having my old translation (possibly adding a new translation of Part I) published in a more formal manner, as there are materials in it which had never been published in English elsewhere and continue to draw the interest of the specialists in the field. I was delighted to hear this proposal with the additional information that it was the wish of Professor Itô also to have a formal publication of an English translation of this book, and he would like me to take up the task of the actual translation of the entire book. As I was not sure whether Professor Kakutani had asked for permission from Professor Itô to translate the portion of the book before he told me to take up the task and decided to circulate copies of the product through the Mathematics Department of Yale, I was very pleased and honored to learn Professor Itô's wishes, and decided to embark on the new translation project with his blessings.

I had thought that I would be able to finish the project within a year or so, but it took much longer than I had expected, partly because I decided, in addition to translating Part I, to retranslate Part II to make the entire manuscript consistent and easier to read. My lack of any previous experience in writing articles in AMS-LaTeX format also forced me to spend a considerable amount of extra time. I am truly grateful to Fukushima, Shinzo Watanabe, and Kanji Ichihara for proof-reading my manuscript very carefully. Although I tried, while I was translating, to correct minor errors in the original as much as I could, I still missed a few, and furthermore, I introduced new errors, typographical and otherwise, of my own (many of which were caused by my inexperience in AMS-LaTeX typesetting). All of these were found and corrected by Fukushima, Watanabe, and Ichihara. Furthermore, as it was explained by Professor Itô in the Author's Preface, Fukushima and Watanabe suggested a few amendments for arguments used in the original Japanese version, in order to eliminate minor inconsistencies and to update some of the discussion, which would have been impossible for me to do as a non-specialist in the field. I am very happy that with their great help, I was finally able to complete this translation project. I am grateful also to the American Mathematical Society for agreeing to publish this translation of Professor Itô's excellent account of the properties of stochastic processes.

Tokyo, January 2006 Yuji Ito