

Foreword

Shanghai Jiao Tong University pioneered in setting up the Department of Materials Science and Engineering in China in 1988, which began with the Department of Metallurgy in 1958, and renamed the School of Materials Science and Engineering in 1997. In the background of discipline development, *Materials Science* textbook, written by Professor Gengxiang Hu, Professor Xun Cai, and Professor Yonghua Rong, was published by Shanghai Jiao Tong University Press in 2000; then the second and third editions were successively published in 2006 and 2010, respectively. This textbook has been used in more than 30 universities or colleges in China so far. In the textbook, a trial has been performed, that is, the knowledge of metals, ceramics, and polymers is not individually described in chapters, but is distributed in knowledge structure of materials science: atomic structure and interatomic bonding, the structure of solids, crystal defects, deformation and recrystallization, phase transformation and phase diagrams, and diffusion. Such a consideration is to let students better understand the difference among metals, ceramics, and polymers. This textbook focuses on the knowledge of structural materials based on mechanical properties and also refers to functional materials based on physical properties. Although it is devoted to materials science, the basic knowledge of the synthesis, processing, and treatment of various materials in practical applications is also introduced because both the theoretical background and engineering common sense are a prerequisite for any engineer to be successful.

As a part of China–Germany cultural exchange, in 2015, De Gruyter invited Shanghai Jiao Tong University Press to publish the *Materials Science* as English edition in Germany. For this reason, Professor Zhuguo Li built a team in the School of Materials Science and Engineering; its members were selected from professors and associate professors who have been teaching this course for many years. This English edition of *Materials Science* adds several sections, cancels some content, corrects some mistakes, and rearranges chapters based on the Chinese edition textbook according to the development of materials science and teaching experience.

I read and revised the whole manuscript of *Materials Science* (English edition), and I hope that this textbook is also welcomed by the European undergraduates.

Yonghua Rong
Professor
School of Materials Science and Engineering
Shanghai Jiao Tong University
December, 2018

