

Preface

Microorganisms play an important role in the protection of humans, animals, plants, air, water, soil, and engineering systems from chemical or biological pollution, deterioration, and corrosion, and in the restoration of polluted and degraded environments. This is an area of civil and environmental engineering but the engineering solutions must be based on the relevant knowledge of microbiology.

This book is intended for undergraduate and graduate students at civil and environmental engineering schools and universities. It covers such essential topics as diversity and functions of microorganisms in environmental engineering systems and environmental bioengineering processes, applied microbial genetics and molecular biology, microbial biodegradation of organic substances, public health microbiology for environmental engineers, microbiology of water and wastewater treatment, and biotreatment of solid waste and soil bioremediation, as well as essential topics for civil engineering processes such as biodeterioration, biocorrosion, and biocementation. The objective is to provide a practical understanding of microorganisms and their functions in the environment and in environmental engineering systems.

To enhance this understanding of microbial functions in engineering systems, I have provided a tutorial bank, a quiz bank, and an exam question bank, as well as the solutions to these tutorial and exam questions in the solutions manual. The principal intention of this solutions manual is to help readers formulate answers to quantitative bioengineering and microbiological questions and to perform design calculations.