PREFACE

The main purpose of the course “Design of Biotechnological Industry Equipment” is to acquaint students with the principles of selection, specification and design of the equipment required to carry out different biotechnological processes.

This manual conforms with the requirements of the course programme on “Design of Biotechnological Industry Equipment” and is indended for students of Major 6.051401 “Biotechnology”.

The scientific principles and theory that underlie the design and operation of the processing equipment are covered in the course “Processes and Apparatus of Biotechnological Industry”.

The manual gives an overview of the principal equipment used in biotechnological processes. It comprises 9 chapters, providing information concerning basic features of the design of technological equipment as well its field of application, advantages and shortcomings. Chapter 1 presents an overview of equipment used for transport of liquids and solids conveying. Chapter 2 describes the modes of liquid and gas sterilization methods and the related equipment. The different types of fermenters used for liquid submerged fementation are considered in chapter 3. Chapter 4 deals with solid state fermenters. Chapter 5 presents the equipment used for conventional filtration, centrifugation as well membrane separation. The main types of evaporators are considered in chapter 6. Chapter 7 covers the use of sorption methods for recovery of target substances and the design of the related equipment. Chapter 8 focuses on the features and application of liquid-liquid and solid-liquid extractors. And finally, different types of dryers are considered in chapter 9.

All answers to process design questions cannot be put into a manual. Even at this date in the development of the biochemical industry, it is common to hear authorities on most kinds of equipment say that their equipment can be properly fitted to a particular task only on the basis of some direct laboratory and pilot plant work. Nevertheless, much guidance and reassuarance are obtainable from general experience and specific examples of successful applications, which this manual attempts to provide.