The biotechnological industry is one of the priority areas for the welfare of mankind in the foreseeable future. When the entire technological chain is conducted by bio-objects in artificial conditions, they must have maximum comfort, which in turn provides the necessary nutrition sources and protection from external adverse effects. The engineering, technical base, processes and devices of biotechnological productions play an important role in regulating proper function of any given bio-object. The book mainly contains the scientific aspects for the engineering design of upstream processing, fermentation, separation and purification of the target products with industrial stages, the principles for assessing the effectiveness and safety of biotechnological productions. The application of biotechnology in various branches of national economy and typical schemes of industrial processes are provided. Each chapter of the book is accompanied by control questions. In terms of volume and awareness of the material, such book in English is published in our country for the first time. It has been prepared taking into account the world practice in biotechnology as a production sector and represents one of the most important elements of the general education for a biotechnologist. The book is intended for students, undergraduates and PhD students, who are trained on the basis of credit technology of education in the specialty of «Biotechnology».