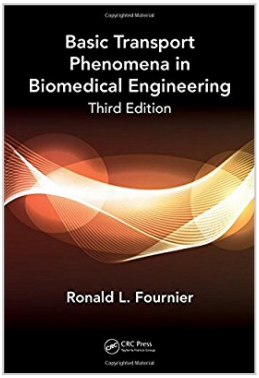

Basic Transport Phenomena in Biomedical Engineering,Third Edition

By Ronald L. Fournier

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Encompassing a variety of engineering disciplines and life sciences, the very scope and breadth of biomedical engineering presents challenges to creating a concise, entry level text that effectively introduces basic concepts without getting overly specialized in subject matter or rarified in language. **Basic Transport Phenomena in Biomedical Engineering, Third Edition** meets and overcomes these challenges to provide the beginning student with the foundational tools and the confidence they need to apply these techniques to problems of ever greater complexity.

Bringing together fundamental engineering and life science principles, this highly accessible text provides a focused coverage of key momentum and mass transport concepts in biomedical engineering. It offers a basic review of units and dimensions, material balances, and problem-solving tips, and then emphasizes those chemical and physical transport processes that have applications in the development of artificial and bioartificial organs, controlled drug delivery systems, and tissue engineering. The book also includes a discussion of thermodynamic concepts and covers topics such as body fluids, osmosis and membrane filtration, physical and flow properties of blood, solute and oxygen transport, and pharmacokinetic analysis. It concludes with the application of these principles to extracorporeal devices as well as tissue engineering and bioartificial organs.

Designed for the beginning student, **Basic Transport Phenomena in Biomedical Engineering, Third Edition** provides a quantitative understanding of the underlying physical, chemical, and biological phenomena involved. It offers mathematical models using the ‘shell balance" or compartmental approaches, along with numerous examples and end-of-chapter problems based on these mathematical models and in many cases these models are compared with actual experimental data. Encouraging students to work examples with the mathematical software package of their choice, this text provides them the opportunity to explore various aspects of the solution on their own, or apply these

techniques as starting points for the solution to their own problems.

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Editorial Review

About the Author
Ronald L. Fournier is a professor in the Department of Bioengineering at The University of Toledo. He is also the founding chair of the Department of Bioengineering. During his twenty years at Toledo, he has taught a variety of chemical engineering and bioengineering subjects to include courses in biochemical engineering, biomedical engineering transport phenomena, biomedical engineering design, and artificial organs. His research interests and scholarly publications are in the areas of bioartificial organs, tissue engineering, novel bioreactors, and pharmacokinetics.

Prof. Fournier is on the editorial review board of Technology and Healthcare in the International Journal of Health Care Engineering. He is a research journal reviewer for the following journals: AIChE Journal, Biotechnology and Bioengineering, Biomaterials, Cell Transplantation, Tissue Engineering, Industrial & Engineering Chemistry, and Enzyme & Microbial Technology. Prof. Fournier is a member of the American Institute of Chemical Engineers, American Diabetes Association, Juvenile Diabetes Foundation International, American Association for the Advancement of Science, American Chemical Society, Cell Transplantation Society, Biomedical Engineering Society, American Society of Engineering Education, and is a Fellow of the American Institute of Medical & Biological Engineering.

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