Biological Engineering

Biological engineering combines the principles of biology and tools of engineering to create usable, tangible, economically-viable products. Bioengineering overlaps substantially with biotechnology and the biomedical sciences in a way analogous to how various other forms of engineering and technology relate to various other sciences.

- Bio-Inspired Sensory Systems (Brooks)

This book will serve well as either an academic text on the subject or an introduction to the variety of proven bio-inspired designs. The focus is on sensory systems that interpret environmental stimuli. It introduces natural photo-, mechano-, and chemo-sensory systems across the animal kingdom and also summarizes various novel engineering ideas that glean ideas from these natural sensory systems.

- Front Matter
- 1: Introduction
- 2: General Concepts from Engineering and Biology
- 3: Photo-sensory Systems
- 4: Mechano-sensory Systems
• Alternative Fuels from Biomass Sources (Toraman)

This text examines the chemistry of technologies of bio-based sources for power generation and transportation fuels.

• Front Matter
  • 1: Why Alternative Fuels from Biomass?
  • 2: Existing Fossil Fuel Technologies for Transportation
  • 3: Electricity Generation 101
  • 4: Use of Biomass in Thermal Technologies
  • 5: Biomass Pyrolysis and Pretreatment
  • 6: General Ethanol Production
  • 7: Processing to Produce Ethanol and Butanol from Carbohydrates and Enzymes
  • 8: Thermochemical Methods to Produce Biofuels
  • 9: Biodiesel Production
  • 10: Algae as a Source for Fuels
  • 11: Economics of Biomass Production – Ethanol, Butanol, and Biodiesel
  • 12: Additional Processes for Fuels from Biomass
  • Back Matter

• Introduction to Biosystems Engineering (Holden et al.)
The discipline of Biosystems Engineering emerged from the traditional strongholds of Agricultural and Food Engineering with the goal of advancing engineering solutions toward creating a sustainable world with abundant food, water, and energy, while maintaining a healthy environment. While the discipline has continued to grow, so has the demand for quality educational resources to teach Biosystems Engineering courses. The publication of this book marks an important step in meeting that demand.

- Front Matter
- 1: Energy Systems
- 2: Information Technology, Sensors and Control Systems
- 3: Machinery Systems
- 4: Natural Resources and Environmental Systems
- 5: Plant, Animal and Facility Systems
- 6: Processing Systems
- Back Matter

- Food and the Future Environment (Karsten and Vanek)

The Future of Food is an introductory-level science course that emphasizes the challenges facing food systems in the 21st century, and issues of sustainability for agriculture and other food production activities, as well as the challenges posed by food insecurity and modern diets to human health and well-being.

- Front Matter
- 1: Introduction
- 2: Environmental Dynamics and Drivers
- 3: Systems Approaches to Managing our Food Systems
- 4: Food Systems and Sustainability
- Back Matter

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