



# Mechatronics

By Sabri Cetinkunt

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## Mechatronics By Sabri Cetinkunt

A comprehensive, cross-disciplinary introduction to the design of computer controlled mechanical systems

With Sabri Cetinkunt's Mechatronics, you can develop the technical background you need to design an automated machine, component, or process, as well as the practical judgment and knowledge of the current state-of-the-art technology you need to find the most effective solution. Drawing on knowledge and techniques from mechanical, aerospace, chemical, electrical and computer engineering, the text explores the theory behind a wide range of basic devices used in automated machines and processes--from gears and pumps, to servomotors and microchips. Various motion-control lab experiments bring together all aspects of the mechatronics field, and provide practical experience in designing circuits and writing software.

### Key Features

- \* Reviews the basic concepts of kinematics and common motion conversion mechanisms.
- \* Provides practical coverage of electronics, focusing on information non-electronics engineers need to know to analyze and design systems containing electronic components.
- \* Offers comprehensive coverage of electro-hydraulic systems with real-world examples from the construction equipment industry.
- \* Includes extensive and accurate coverage of all types of sensors, enabling you to work on any project that involves measurement and testing.
- \* Discusses electric motors in detail, including DC motors, steppers, AC motors, and SR motors--key knowledge for designers of factory automation and robotic projects.
- \* Covers microcontroller hardware and software issues, using PIC-18F452 microcontroller as an example.
- \* Includes the often neglected topic of programmable logic controllers (PLCs) which forms the foundation of factory automation.
- \* The first textbook to cover the coordination motion control concepts as they are used in industry using state-of-the-art motion controllers and servo motors (i.e, applications in printing machines, coil winding machines, machine tools, and robotics).
- \* Various motion-control-related lab experiments involve the construction of

electronic interface circuits and the programming of real-time controls software.

- \* Discusses modeling of mechatronic systems and components, control system design, analysis and simulation in MATLAB.
- \* References real devices or components in examples and applications.
- \* Provides a comprehensive list of supplies of components needed in mechatronic systems.

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### Editorial Review

From the Back Cover

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### About the Author

**Sabri Cetinkunt** is a professor of Mechanical Engineering at the University of Illinois at Chicago. He received the B.S. degree from the Technical University of Istanbul in 1982, M.S. and Ph.D. degrees from the Georgia Institute of Technology in 1984 and 1987, respectively. His research interests include mechatronics, motion control, servo control systems, high speed automated machine design, robotics, nano positioners, precision systems, electro-hydraulic control and applications in earth moving equipment technology, expert systems, neural networks, real time systems.

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