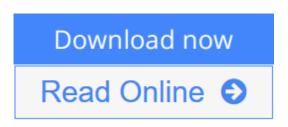# Introduction to Robotics in CIM Systems (5th Edition)

By James A. Rehg

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Written from a manufacturing perspective, this book takes readers step-by-step through the theory and application techniques of designing and building a robot-driven automated work cell—from selection of hardware through programming of the devices to economic justification of the project. All-inclusive in approach, it covers not only robot automation, but all the other technology needed in the automated work cell to integrate the robot with the work environment and with the enterprise data base. Robot and other required automation hardware and software are introduced in the order in which they would be selected in an actual industrial automation design. Includes system troubleshooting guides, case studies problems, and worked example problems. Robot Classification. Automated Work Cells and CIM Systems. End-of-Arm Tooling. Automation Sensors. Work-Cell Support Systems. Robot and System Integration. Work-Cell Programming. Justification and Applications of Work Cells. Safety. Human Interface: Operator Training, Acceptance, and Problems. For those interested in Robotics and Manufacturing Automation or Production Design.

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Editorial Review

From the Publisher
This text addresses the use of robots for flexible automation from a manufacturing systems viewpoint -- i.e., how robots interface with all the manufacturing hardware and software. It contains an abundance of industrial applications, and weaves a major case study throughout -- allowing students to follow -- and join -- an automation design team as they work through each stage of the design process. An accompanying disk and video provide project data.

From the Back Cover

Employment trends in the field of robotics have changed over the years. Engineers and technicians no longer concentrate solely on robot technology; instead, they are capable of working on the entire production system. For this reason, any training in robotics must reflect this emphasis on the total system. The need for personnel who can design, develop, implement, and provide support for automated production systems with robots is significant and is growing.

This fifth edition of *Introduction to Robotics in CIM Systems* includes information about the hardware, software, and programming that support the implementation of automated work cells and manufacturing systems.

New in the fifth edition of the text:

- Goals and objectives listed at the beginning of each chapter.
- A career spotlight highlights careers related to the concepts being covered in every chapter.
- Updated information on safety and troubleshooting.
- A section outlining program commands for the Yaskawa robot.
- Major updates and additions throughout.

Instructors who are using this book for a course should obtain the accompanying Instructor's Manual (ISBN 0-15-060245-0).

About the Author

James A. Rehg, CMfgE, is an associate professor of engineering at Penn State-Altoona. He earned a BS and MS in electrical engineering from St. Louis University and has completed additional graduate work at Wentworth Institute, University of Missouri, South Dakota School of Mines and Technology, and Clemson University. Before moving to Penn State, he was director of the Computer Integrated Manufacturing project and department head of CAD/CAM and Machine Tool Technology at Tri-County Technical College, and previous to that he was director of Academic Computing and the Manufacturing Productivity Center at Trident Technical College. Professor Rehg also served as director of the Robotics Resource Center at Piedmont Technical College and department head of Electronic Engineering Technology at Forest Park Community College. His industrial experience includes work in instrumentation at McDonnell Douglas Corporation and consulting in the areas of computer-aided design, robotics, computer-integrated manufacturing, and programmable logic controllers.

Professor Rehg has written five texts on robotics and automation and many articles on subjects related to training in automation and robotics. His most recent text is *Computer-Integrated Manufacturing,* 2nd ed., with coauthor Henry Kraebber of Purdue University, published by Prentice Hall in 2000. Professor Rehg has received numerous state awards for excellence in teaching, including the outstanding instructor in the nation by the Association of Community College Trustees and the Penn State Engineering Society Outstanding Teaching Award in 1998.

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