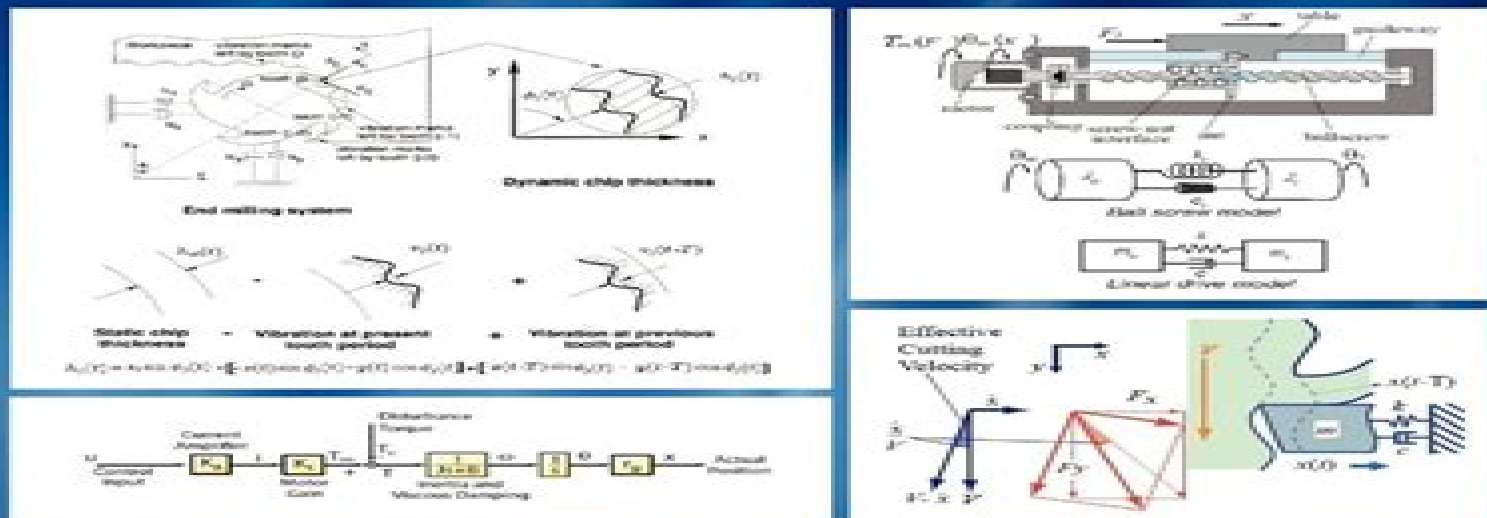


MANUFACTURING AUTOMATION

SECOND EDITION

METAL CUTTING MECHANICS,
MACHINE TOOL VIBRATIONS, AND CNC DESIGN



YUSUF ALTINTAS

Manufacturing Automation Metal Cutting Mechanics Machine Tool Vibrations And Cnc Design

**Norberto Lopez de Lacalle,Aitzol
Lamikiz Mentxaka**



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Manufacturing Automation Yusuf Altintas, 2012-01-16 Metal cutting is widely used in producing manufactured products. The technology has advanced considerably along with new materials, computers and sensors. This new edition considers the scientific principles of metal cutting and their practical application to manufacturing problems. It begins with metal cutting mechanics, principles of vibration and experimental modal analysis applied to solving shop floor problems. There is in depth coverage of chatter vibrations, a problem experienced daily by manufacturing engineers. Programming design and automation of CNC computer numerical control machine tools, NC numerical control programming and CAD/CAM technology are discussed. The text also covers the selection of drive actuators, feedback sensors, modelling and control of feed drives, the design of real time trajectory generation and interpolation algorithms and CNC oriented error analysis in detail. Each chapter includes examples drawn from industry design projects and homework problems. This is ideal for advanced undergraduate and graduate students and also practising engineers.

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CNC machines based on recently issued international standards and includes chapters on cutting fluids and gear machining. The authors also offer updated information on tooling grades and practices for machining compacted graphite iron, nickel alloys and other hard to machine materials as well as a full description of minimum quantity lubrication systems tooling and processing practices. In addition, updated topics include machine tool types and structures, cutting tool materials and coatings, cutting mechanics and temperatures, process simulation and analysis and tool wear from both chemical and mechanical viewpoints. Comprised of 17 chapters, this detailed study describes the common machining operations used to produce specific shapes or surface characteristics. Contains conventional and advanced cutting tool technologies. Explains the properties and characteristics of tools which influence tool design or selection. Clarifies the physical mechanisms which lead to tool failure and identifies general strategies for reducing failure rates and increasing tool life. Includes common machinability criteria tests and indices. Breaks down the economics of machining operations. Offers an overview of the engineering aspects of MQL machining. Summarizes gear machining and finishing methods for common gear types and more. Metal Cutting Theory and Practice Third Edition emphasizes the physical understanding and analysis for robust process design, troubleshooting and improvement and aids manufacturing engineering professionals and engineering students in manufacturing engineering and machining processes programs.

Applied Mechanics Reviews, 2000

Analysis of Machining and Machine Tools Steven Liang, Albert J. Shih, 2015-12-29 This book provides readers with the fundamental analytical and quantitative knowledge of machining process planning and optimization based on advanced and practical understanding of machinery mechanics, accuracy, dynamics, monitoring techniques and control strategies that they need to understand machining and machine tools. It is written for first year graduate students in mechanical engineering and is also appropriate for use as a reference book by practicing engineers. It covers topics such as single and multiple point cutting processes, grinding processes, machine tool components, accuracy and metrology, shear stress in cutting, cutting temperature and thermal analysis and machine tool chatter. The second section of the book is devoted to Non Traditional Machining where readers can find chapters on electrical discharge machining, electrochemical machining, laser and electron beam machining and biomedical machining. Examples of realistic problems that engineers are likely to face in the field are included along with solutions and explanations that foster a didactic learning experience.

Topics in Experimental Dynamics

Substructuring and Wind Turbine Dynamics, Volume 2 R. Mayes, D. Rixen, D.T. Griffith, D. De Klerk, 2025-08-07 Topics in Experimental Dynamics Substructuring and Wind Turbine Dynamics Volume 2 Proceedings of the 30th IMAC A Conference and Exposition on Structural Dynamics 2012 the second volume of six from the Conference brings together 31 contributions to this important area of research and engineering. The collection presents early findings and case studies on fundamental and applied aspects of Structural Dynamics.

Bayesian-Based Predictive Analytics for Manufacturing Performance Metrics in the Era of Industry 4.0 Salehi, Mehdi, 2019-10-10

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