1.	Record Nr.	UNINA9910830481803321
	Autore	Duffie Neil A.
	Titolo	Control theory applications for dynamic production systems : time and frequency methods for analysis and design / / Neil A. Duffie
	Pubbl/distr/stampa	Hoboken, New Jersey : , : John Wiley & Sons, Inc., , [2022] ©2022
	ISBN	1-119-86286-8 1-119-86284-1
	Edizione	[First edition.]
	Descrizione fisica	1 online resource (322 pages)
	Disciplina	658.5/6
	Soggetti	Production control Control theory
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Nota di contenuto	Continuous-Time and Discrete-Time Modeling of Production Systems -- Transfer Functions and Block Diagrams -- Fundamental Dynamic Characteristics and Time Response -- Frequency Response -- Design of Decision-Making for Closed-Loop Production Systems -- Application Examples -- Bibliography.
	Sommario/riassunto	"Production planning, operations and control are being transformed by digitization, creating opportunities for automation of decision making, reduction of delays in making and implementing decisions, and significant improvement of production system performance. Meanwhile, to remain competitive, today's production industries need to adapt to increasingly dynamic and turbulent markets. In this environment, production engineers and managers can benefit from tools of control system engineering that allow them to mathematically model, analyze and design dynamic, changeable production systems with behavior that is effective and robust in the presence of turbulence. Research has shown that the tools of control system engineering are important additions to the production system engineer's toolbox, complementing traditional tools such as discrete event simulation. However, many production engineers are unfamiliar with application of these tools in their field. This book is a practical yet thorough introduction to the use

of transfer functions and control theoretical methods in the modeling, analysis and design of the dynamic behavior of production systems. Production engineers and managers will find this book a valuable and fundamental resource for improving their understanding of the dynamic behavior of modern production systems and guiding their design of future production systems. In this book, emphasis is placed on analysis and examples that illustrate the opportunities that control theoretical time and frequency perspectives present for understanding and designing the behavior of dynamic production systems. The dynamic behavior of the components of these systems and their interactions must be understood first before decision making can be designed and implemented that results in favorable overall dynamic behavior of the production system, particularly when the structure contains feedback. In the re-planning system with the structure in Figure 1.1, control theoretical modeling and analysis reveals relationships between the frequency of re-planning decisions and delays in making and implementing decisions that results undesirable oscillatory behavior unless these relationships are taken into account in design of replanning decision making. Benefits of reducing delays using digital technologies can be quantified and used to guide re-planning cycle redesign"--