

1. Record Nr.	UNINA9910736008803321
Titolo	Handbook of Model-Based Systems Engineering / / Azad M. Madni, Norman Augustine, and Michael Sievers, editors ; foreword by Charles Bolden Jr
Pubbl/distr/stampa	Cham, Switzerland : , : Springer Nature Switzerland AG, , [2023] ©2023
ISBN	3-030-93582-5
Edizione	[First edition.]
Descrizione fisica	1 online resource (645 illus., 456 illus. in color. eReference.)
Disciplina	620.001171
Soggetti	Systems engineering - Mathematical models
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction -- MBSE Foundations -- Model-Based Verification and Validation -- MBSE Testbeds -- MBSE for Human-Systems Integration -- Infrastructure Management and Model Curation -- MBSE for Cyber-Physical-Human Systems -- Engineering Resilient Systems and System-of-Systems -- Exploiting Disciplinary Convergence -- Stretch Goals.
Sommario/riassunto	This handbook brings together diverse domains and technical competences of Model Based Systems Engineering (MBSE) into a single, comprehensive publication. It is intended for researchers, practitioners, and students/educators who require a wide-ranging and authoritative reference on MBSE with a multidisciplinary, global perspective. It is also meant for those who want to develop a sound understanding of the practice of systems engineering and MBSE, and/or who wish to teach both introductory and advanced graduate courses in systems engineering. It is specifically focused on individuals who want to understand what MBSE is, the deficiencies in current practice that MBSE overcomes, where and how it has been successfully applied, its benefits and payoffs, and how it is being deployed in different industries and across multiple applications. MBSE engineering practitioners and educators with expertise in different domains have contributed chapters that address various uses of MBSE and related technologies such as simulation and digital twin in the systems lifecycle. The introductory chapter reviews the current state of practice, discusses the

genesis of MBSE and makes the business case. Subsequent chapters present the role of ontologies and meta-models in capturing system interdependencies, reasoning about system behavior with design and operational constraints; the use of formal modeling in system (model) verification and validation; ontology-enabled integration of systems and system-of-systems; digital twin-enabled model-based testing; system model design synthesis; model-based tradespace exploration; design for reuse; human-system integration; and role of simulation and Internet-of-Things (IoT) within MBSE. .
