

Life-cycle analysis is a systematic tool for efficient and effective management of deteriorating structures. Recently, approaches for life-cycle management of deteriorating structures have been extensively developed due to ever increasing demand for sustainable development. This book provides state-of-the-art theoretical background and practical applications of life-cycle analysis and maintenance optimization for fatigue-sensitive structures. The primary topics covered include probabilistic concepts of life-cycle performance and cost analysis, fatigue crack detection under uncertainty, optimum inspection and monitoring planning, multi-objective life-cycle optimization, and decision making in life-cycle analysis. Applications contain fatigue-sensitive bridges and ships. This book is targeted at students, researchers and practitioners in civil and marine engineering.

Dr. Dan Frangopol is the inaugural holder of the Fazlur R. Khan Endowed Chair of Structural Engineering and Architecture at Lehigh University. He is widely recognized as a leading educator and pioneer in the field of life-cycle engineering. His main research interests are in the development and application of probabilistic concepts and methods to civil and marine structures. His research and professional service have garnered numerous awards from ASCE, IABMAS, IABSE, IALCCE, IASSAR, SIE and other professional organizations. He holds 4 honorary doctorates and 14 honorary professorships. He is a foreign member of both the Academia Europaea and the Royal Academy of Belgium for Science and the Arts, an honorary member of the Romanian Academy, and a distinguished member of ASCE.

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