

INTERNATIONAL CENTRE FOR MECHANICAL SCIENCES

COURSES AND LECTURES - No. 317



RELIABILITY PROBLEMS:  
GENERAL PRINCIPLES AND APPLICATIONS  
IN MECHANICS OF SOLIDS  
AND STRUCTURES

EDITED BY

F. CASCIATI  
UNIVERSITY OF PAVIA

J. B. ROBERTS  
UNIVERSITY OF SUSSEX



SPRINGER-VERLAG WIEN GMBH

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**Originally published by Springer Verlag Wien-New York in 1991**

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ISBN 978-3-211-82319-4

ISBN 978-3-7091-2616-5 (eBook)

DOI 10.1007/978-3-7091-2616-5

## **PREFACE**

*In many fields of engineering it is necessary to formulate and implement procedures for the assessment of system reliability. This involves an estimation of the probability that a vector of design variables stays within some prescribed safe domain. In some situation it is sufficient to employ a static analysis, taking into account the statistical variability of the system parameters. However, often the dynamic response of an uncertain, time-varying non-linear system to random disturbances must be considered.*

*Significant advances in reliability theory, during the sixties and seventies have recently been utilized to construct a general design methodology, suitable for incorporating into decision making processes. This is currently finding application in such diverse fields as offshore technology, aerospace design and disaster prevention in civil and mechanical engineering.*

*Although a basic theoretical framework has been established the inherent techniques require constant development and improvement, to meet the demands imposed by new advanced engineering projects. The subject is, therefore, still in an active state of development.*

*This book presents, to researchers and engineers working on problems concerned with the mechanics of solids and structures, the current state of the development and application of reliability methods. The topics covered reflect the need to integrate, within the overall methodology, statistical methods for dealing with systems which have*

*uncertain parameters and random excitation with the development of suitable safety index and design codes. The basic principles of reliability theory, together with current standard methodology, are reviewed. An introduction to new developments is also provided.*

*F. Casciati*

*J. B. Roberts*

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