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INTERNATIONAL CENTRE FOR MECHANICAL SCIENCES

COURSES AND LECTURES - No. 348



ENGINEERING MECHANICS
OF FIBRE REINFORCED POLYMERS AND
COMPOSITE STRUCTURES

EDITED BY

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way distract the reader.

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PREFACE

This monograph is based on the lecture notes of the 4th International IUTAM Summer School on "Engineering Mechanics of Fibre Reinforced Polymers and Composite Structures" held at the International Center for Mechanical Sciences (CISM) in Udine, Italy, from July 5 to 9, 1993 by (in alphabetic order) Professors M. CHRZANOWSKI - Politechnika Krakowska, Krakow, Poland; P. GUDMUNDSON - Royal Institute of Technology, Stockholm, Sweden; J. HULT - Chalmers University of Technology, Gothenburg, Sweden; G. NONHOFF - Flugzeug- und Triebwerksbau, FH-Aachen, Germany; F.G. RAMMERSTORFER - Vienna University of Technology, Vienna, Austria and - last but not least - G.S. SPRINGER- Stanford University, Stanford, CA, USA.

The book aims at giving an overview of current methods in engineering mechanics of FRP composites as well as composite or hybrid components and structures. Main emphasis is laid on basic micro and macro mechanics of laminates. Continuous as well as short fibre composites are studied, and criteria for different kinds of failure are treated. Micromechanical considerations for material characterization and mechanisms of static ductile and brittle rupture are studied, as well as FRP structures under thermal and dynamic loading programs. Optimum design, manufacturing process simulations and environmental effects are described as well.

These contents should make designers familiar with the opportunities and limitations of modern high quality fibre composites. Practical engineering applications of the described analytical and numerical methods are also presented.

We, as the organizers of the Summer School and as the editors of this monograph, would like to thank all our colleagues who contributed by their lectures and by preparing chapters of this book. We also thank the IUTAM General Assembly, especially the Secretary

General, Professor Franz Ziegler, for selecting our course to be held as the 4th IUTAM International Summer School. We thank CISM for organizing this course and for the hospitality which the lecturers were provided with during their stay at Udine. The lecturers and authors owe special thanks to Professor Sandor Kaliszky, resident Rector of CISM, for his efforts in supporting this course, and to Professor Carlo Tasso for encouraging the lecturers to write this monograph.

*J. Hult
F.G. Rammerstorfer*

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