INTEGRATED COMPUTER-AIDED DESIGN OF MECHANICAL SYSTEMS


This book is intended for mechanical, industrial and manufacturing engineers, design engineers and engineering managers. It is also intended for postgraduates undertaking mechanical, industrial, manufacturing and production engineering degrees. It is also useful for technologists, academics and researchers working in the field of CAD/CAM.

Whilst it is largely self-contained, readers are required to have some basic knowledge of design, analysis and manufacture; their awareness of computers will also be of value.

Some may feel that the title of this book does not impart the considerable depth and scope of its text, covering as it does the whole aspect of computer-aided engineering from design concept through to manufacture. I would agree with them, but it is preferable to a title that promises more than a book can offer.

In his introductory chapter the author makes several observations on the subject of design philosophy: two of which I feel it appropriate to quote:

(i) "In general, designing should not be confused with art, with science or with mathematics. It is a hybrid activity which depends, for its successful execution, upon a proper blending of all three and is most unlikely to succeed if it is exclusively devoted with any one."

(ii) "Design, in general terms, can be defined as the means by which solutions are contrived to people's problems and in response to a need."

No further comment is necessary except perhaps that these two observations set the standard of this book for me and what ensued did not bring disappointment.

The introductory chapter provides a very good foundation to the main text beginning with the developing design process, design methodology and a brief introduction together with the terminology used in the following:

(a) Computer graphics
(b) Computer-aided engineering
(c) Computer-aided design
(d) Computer-aided analysis
(e) Computer-aided draughting
(f) Computer integrated manufacture


Chapter 2 deals with automated modelling.

Chapter 3 provides a detailed account of the computer-aided design of two practical case studies involving the design of:

(i) a centrifugal peening equipment
(ii) a fluid coupling

Chapter 4 provides a truly practical introduction to the application of the finite element method to structural stress analysis of mechanical systems.

Chapter 5 provides a complete static stress analysis and dynamic

continued on page 7
Book Reviews continued from page 4

response, studies are performed on the different
designs examined.

Chapter 6 deals with the computer integrated
manufacturing aspects of the work using the same
data base developed during the modelling stage.
Also, in this chapter some coverage is provided
for numerically controlled machines.

The use of computers in engineering
undoubtedly constitutes one of the greatest strides
in modern technological development.

They have provided freedom from drudgery
and time-wasting repetition to designers and
draftsmen giving a dramatic upturn in their
productivity.

In order to maximize the immense value of the
computer, it is essential to extend their application
beyond the design file to the related activities
of analysis and computer integrated manufacture.

It is with this aim in mind that the author has
prepared this most excellent textbook.

The case studies are particularly helpful being
very typical of everyday design and
manufacturing problems. For example each study
itself being preceded by the relevant design
philosophy and supported by outstandingly good
diagrams and drawings.

This book will, without doubt, become
essential reading with continued reference and
study for all forward-looking engineers involved
in design, analysis and manufacture.

Reviewed by G. W. Vouden, Library &
Information Services
Committee, Production Engineer, March,
1988

SEM SEMINAR

RESIDUAL STRESS
JUNE 12-15, 1990

CO-SPONSORED BY
MECHANICAL FAILURES PREVENTION GROUP (MFPG) AND
CANADA CENTRE FOR MINERAL AND ENERGY TECHNOLOGY
(CANMET/MLT)
OTTAWA, ONTARIO
CANADA

THE OBJECTIVE: Residual stresses and loading stresses are of great significance to design, metallurgical,
structural and quality control engineers because of their significant effect on such parameters as
design load limits, fatigue, stress corrosion cracking and component warping. The objective of this
seminar is to review certain established and recently developed residual stress measurement methods.
The methods presented in detail are considered by the instructors to be the most currently viable
approaches based on practical problem solving experience.

THE PROGRAM:
Section 1 "Residual Stress Measurement by the
and X-Ray Diffraction Method"
Session 2 "Residual Stress Measurement by the
Manufacturers' Exhibit
Session 3 "Residual Stress Measurement by the
Mr. Michael Flaman
Ontario Hydro Research Division
One-hour afternoon tour through the Metals
Technology Laboratories of CANMET
Section 5 "Evaluation of Residual Stress by
Barkhausen Noise Analysis (BNA)"
Dr. Kirth Tutto
American Stress Technologies, Inc.
SEMINAR LOCATION: CANMET/MLT, Ottawa
HOTEL: The Skylon, Ottawa
101 Lyon Street
Ottawa, K1A 0G1 Ontario
$85 single, $95 double plus tax

Section 6 "Residual Stress Measurement by the
Cut and Sectioning Method"
Dr. George Roy
CANMET/Metals Technology Laboratories
Section 7 "Residual Stress Measurement by the
Dr. Thomas Holdren
Atomic Energy of Canada Ltd. (AECL)
Section 8 One-day visit at the Atomic Energy of
Canada Ltd. in Chalk River, tour through
the National Research Universal reactor
and the X-ray lab. There will be a demon-
stration of residual stress determination
by neutron diffraction. Bus
transportation and lunch is included.

REGISTRATION FEE: Members $550
Nonmembers $650

For information and to register: SEM Seminar
Department, 7 School Street, Bethel, CT 06801
(203) 795-8373 FAX (203) 795-8584

The Shot Peener · Volume 3 · Issue 4