

## FOREWORD

We, the teaching and research staff of the Institute Machine Design, present ourselves again after 1990 in a separate volume. The passed years brought great changes in politics and economy effecting on our life, making it more complicated. Great many things had to be reconsidered, reorganized and changed. Evidently, the fields of sciences, research and development and design have been effected by the same phenomenon.

The main duty of our institute is to teach product — and machine design as an engineering activity. However, the real tasks of our engineering work is mainly effected by the competition in the market. The result of the design and development processes must be products salable by all means. They must be produced and sold in a professional way. This requires new attitudes, abilities and skills to be attained by the designers. Nowadays the assignment of a designer is not completed by designing and computing only. On the one hand the assignment is connected with development and continuing in research laboratories and workshops. While on the other hand, in the forming home and international competition, the design of a world level product cannot be separated from research activities on scientific level.

Therefore the appliances of research must be applied in many instances. Being professors of a technical university, our main duty is — above teaching — to produce development research works and from time to time primary investigation type assignments should be carried out, too. Above or instead of the traditional knowledge of the product and machine design new elements and trends having been appeared, like: new expectations (views of environmental protection, quality assurance, profitability), new materials (polymers, composite materials, ceramics), new design processes (concurrent engineering, team work, CAX technologies, structure, shape, size optimization's), recent production technologies and new operating principles related to driving systems, efficiency improvement, reliability improvement, automatization.

The above ideas should be understood, evaluated and applied by a good designer in his (or her) own creative activities.

However, it is not possible to fulfil a teaching assignment properly without carrying out high level research and development works which also

contribute to maintain high teaching standard as well by providing deeper knowledge of the subject and critical views.

Probably neither today's home economical reality nor the near future give us comprehensive assignments. Nevertheless we admit that it is possible to find important and interesting assignments along the main stream of science and the 'milestone making' development projects. We believe that all detailed revealing of important technical problems and all elaborated research and development works help to broaden the technical and scientific knowledge.

Let us hope, dear reader, that you may find a favourable view from the assortment of articles published presently here describing the results of both the junior and the senior teaching and research staff members of our institute. Perhaps, some results and solutions published may be in your help in solving a related problem and by this we could provide a little contribution in the broadening of your technical, scientific and design knowledge.

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