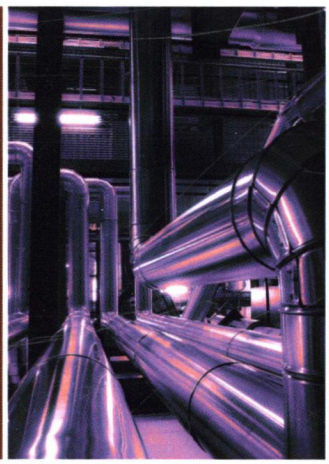
Novel Processes for Advanced Manufacturing



Edited by:
Harinirina Randrianarisoa, Ph.D.

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Novel Processes for Advanced Manufacturing

Since the early beginning of industrial revolution, manufacturers are consistently trying to improve the characteristics of their products and efficiency of the manufacturing processes. Man started manufacturing from primitive style to produce very simple products to make his life easier. There were no machines and devices all the manufacturing work was done by hand and the ordinary things of daily use such as axe, hammer and chisels were used as tools for assistance in manufacturing operation. As, time passed, man discovered many new phenomenon of nature, the knowledge of science, technology, engineering and management evolved and systematic studies on manufacturing were started. Today, Manufacturing has grown to a tremendous level, it has become a vast subject. It has become an inter-disciplinary approach which is an integration of many sciences, engineering, management, commerce and finance disciplines etc. The most recent couple of years have seen unparalleled changes all through the world. Quick changes in the business sectors demand variety of product life cycles and top notch products at low costs. Clients now demand exceptionally high levels of quality and performance. This global trend and market competition has motivated product manufacturing firms to search for dynamic and mechanized manufacturing processes in all fields. In this way many manufacturing processes, technologies and systems have came in existence and research is still continued in this field and many new, radically different manufacturing processes, technologies and systems are expected to come into being in the coming years. The aim of this book is to provide a description of modern manufacturing practices and novel processes which are speedily replacing the conventional manufacturing processes and systems. This book presents a picture of the globally changing manufacturing world along with the latest market challenges and how they are being addressed. This book is of interest for graduate level audience who are keen to get in touch with new manufacturing systems, processes and technologies. This book is also of interest for manufacturers and technical staff working in today's innovative manufacturing corporate world. The first chapter provides a general view of advanced manufacturing systems, processes technologies and techniques which are used for controlling them. In the later chapters advances in material forming processes, joining processes, processing techniques, machining, material removal techniques, additive manufacturing, manufacturing process management , manufacturing process control are described and green manufacturing science, engineering, processes, technologies, implementation planning and framework have been described.

Hari Randrianarisoa obtained is Ph.D from Institute of Electronics, Microelectronics and Nanotechnology (IEMN) of the University of Science and Technology – Lille (France). His thesis focused for designing and manufacturing of thermal micro sensors. His interests span from on renewable energy especially solar energy. He has a strong knowledge in technology transfer field. He is currently working as a Business advisor for economic development organization in Québec City and as a consultant Scientist advisor.

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About the Editor

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Preface

Since the early beginning of industrial revolution, manufacturers are consistently trying to improve the characteristics of their products and efficiency of the manufacturing processes. Man started manufacturing from primitive style to produce very simple products to make his life easier. There were no machines and devices all the manufacturing work was done by hand and the ordinary things of daily use such as axe, hammer and chisels were used as tools for assistance in manufacturing operation. As, time passed, man discovered many new phenomenon of nature, the knowledge of science, technology, engineering and management evolved and systematic studies on manufacturing were started. Today, Manufacturing has grown to a tremendous level, it has become a vast subject. It has become an inter-disciplinary approach which is an integration of many sciences, engineering, management, commerce and finance disciplines etc.

The most recent couple of years have seen unparalleled changes all through the world. Quick changes in the business sectors demand variety of product life cycles and top notch products at low costs. Clients now demand exceptionally high levels of quality and performance. This global trend and market competition has motivated product manufacturing firms to search for dynamic and mechanized manufacturing processes in all fields. In this way many manufacturing processes, technologies and systems have came in existence and research is still continued in this field and many new, radically different manufacturing processes, technologies and systems are expected to come into being in the coming years.

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