Fundamentals of Manufacturing
Supplement

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Editor

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Preface

This book was designed to be used in conjunction with Chapters 11-47 of *Fundamentals of Manufacturing*, Second Edition to provide a structured review for individuals planning to take the Certified Manufacturing Engineer (CMfgE) examination. The topics covered are the result of a 1999 survey of manufacturing managers, manufacturing technologists and engineers, and manufacturing educators. Its purpose was to identify fundamental competency areas required of manufacturing technologists and engineers in the field.

While the objective of this supplement is to help prepare manufacturing engineers for the certification process, it is also a useful reference for manufacturing professionals and individuals with limited manufacturing experience or training.

Introduction

MANUFACTURING CERTIFICATION

Manufacturing is concerned with energy, materials, tools, equipment, and products. Excluding services and raw materials in their natural state, most of the remaining gross national product is a direct result of manufacturing.

Modern manufacturing activities have become exceedingly complex because of rapidly increasing technology and expanded environmental involvement. This, coupled with increasing social, political, and economic pressures, has increased the demand for highly skilled manufacturing engineers and managers.

The principal advantage of certification is that it proves an individual possesses not only the minimum academic requirements, which are based upon a specific set of standards, but more importantly, the practical experience required of a manufacturing engineer or manager on the job.

Many persons currently employed in industry can successfully measure themselves against the set of standards, but they cannot provide documentation concerning their ability. SME's certification program is designed to provide successful candidates with documentary evidence of their abilities. The designations Certified Manufacturing Engineer (CMfgE), Certified Manufacturing Technologist (CMfgT), Certified Engineering Manager (CEM), and/or Certified Enterprise Integrator (CEI) are bestowed upon successful candidates.

Philosophically, the purpose of manufacturing certification is to gain increased acceptance of manufacturing engineering and management as a profession and to ultimately improve overall manufacturing effectiveness and productivity.

PURPOSE AND OVERVIEW

The purpose of this supplement, in conjunction with Chapters 11-47 of *Fundamentals of Manufacturing*, Second Edition, is to provide the manufacturing engineer or manager with a structured review in preparation for taking the Certified Manufacturing Engineer (CMfgE) examination. It is also a useful reference for manufacturing professionals or individuals with limited manufacturing experience or training.

The major areas of manufacturing reviewed in the text include personal effectiveness, manufacturing processes, fixture and jig design, quality, engineering economics, manufacturing management, and industrial safety, health, and environmental management.

Sample problems and questions are included at the conclusion of each chapter for practice. Answers are included for all questions, but it is recommended that questions be attempted before reading the answers.

EXAMINATION SPECIFICS

The Certified Manufacturing Engineer (CMfgE) examination is a three-hour open-book exam consisting of 150 multiple-choice questions. The exam consists of 110 general

manufacturing engineering knowledge questions and 40 questions from preselected focus areas within the "body of knowledge." The focus areas are processes, management, integration and control, joining and assembly, support operations, and quality.

Each major area and its relative emphasis in the exam are listed as follows:

Mathematics/Applied and Engineering Sciences/ Materials	14.6%
Product Design	13.8%
Manufacturing Processes	12.7%
Production Systems	21.1%
Automated Systems and Control	5.2%
Quality	13.1%
Manufacturing Management	13.3%
Personal/Professional Effectiveness	6.2%

ADDITIONAL INFORMATION

The bibliography at the end of this book contains appropriate resources for more detailed information on the topics covered. Additional study resources for the Certified Manufacturing Engineer (CMfgE) exam include, but are not limited to, a pencil and paper practice exam and a Windows® -based self-assessment program. The self-assessment program (based on the same topics as the exam) will help to determine your strengths and weaknesses. Built-in bibliographic references suggest study materials for topics where additional help is needed.

For more information regarding the exam or additional resources, please contact the Society of Manufacturing Engineers at 313-271-1500 or e-mail: training@sme.org. Information also can be obtained on SME's website, www.sme.org/certification.

Any questions or comments regarding this supplement are welcome and appreciated. Please direct questions and/or comments to training@sme.org.

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