

Preface

Nowadays, there is leading to a greater awareness worldwide of the role that dimensional and mechanical measurement plays in underpinning activities in all areas of science and technology. It provides a fundamental basis not only for the physical sciences and engineering, but also for chemistry, the biological sciences and related areas such as the environment, medicine, agriculture and food. Laboratory programmes have been modernized, sophisticated electronic instrumentation has been incorporated into the programme and newer techniques have been developed. Keeping these views in mind, this book is written which deals with not only the techniques of dimensional measurement but also the physical aspects of measurement techniques.

In today's world of high-technology products, the most important requirements of dimensional and other accuracy controls are becoming very stringent as a very important aspect in achieving quality and reliability in the service of any product in dimensional control. Unless the manufactured parts are accurately measured, assurance of quality cannot be given. In this context, the first part of the book deals with the basic principles of dimensional measuring instruments and precision measurement techniques. This part of the book starts with discussing the basic concepts in metrology and measurement standards in the first two introductory chapters. Then, linear, angular, machine tool and geometrical shape metrology along with interferometry techniques and various types of comparators are explained thoroughly in the subsequent chapters. Concepts of limits, fits and tolerances and measurement of surface finish are illustrated in detail. Chapters 11 and 12 discuss the metrology of standard machine parts like screw threads and gears respectively. Miscellaneous measurement and recent advancements in the field of metrology are discussed in the last two chapters of the first part of the book.

The second part of this book begins with the explanation of measurement systems and transducers. The methods of measuring mechanical quantities, viz., force, torque, vibration, pressure, temperature, strain and flow measurement are discussed subsequently, covering both the basic and derived quantities. Effort has been made to present the subject in SI units. Some of the recent developments such as use of laser techniques in measurement have also been included.

The Online Learning Center of the book can be accessed at <http://www.mhhe.com/bewoor.mm> and contains the following material:

For Instructors

- Solution Manual
- PowerPoint lecture slides
- Full-resolution figures and photos from the text
- Model syllabi

For Students

- Interactive quiz
- Objective-type questions

Our objective is to provide an integrated presentation of dimensional and mechanical measurement. This book has been developed in recognition not only with the interdisciplinary nature of engineering practice, but also with the trend in engineering curriculum. The authors have consistently crafted a text such that it gives the reader a methodical and well-thought-out presentation that covers fundamental issues common to almost all areas of dimensional and mechanical measurement. Information on particular instruments and concepts has been combined to improve the logical flow of the manuscript. The coverage is such that the book will be useful both for post-graduate, graduate, polytechnic engineering ITI students and other graduation-level examinations (like AMIE), and competitive examinations and entrance examinations like GATE. We believe that the concise presentation, flexible approach readily tailored to individual instructional needs and the carefully structured topics of the book allow the faculty a wide scope in choosing the coverage plan for students and will prove to be a good resource material for teachers. It would also be equally helpful to professionals and practicing engineers in the field of design, manufacturing and measurement.

We wish to acknowledge our special thanks to measurement instrument manufacturers', viz., M/s Mahr GmbH for permitting us to use the figures from their product catalogue in the present text. We owe our gratitude to many of our colleagues and the management of Vishwakarma Institute of Information Technology, Pune; Sinhgad College of Engineering, Pune; and D Y Patil College of Engineering, Akurdi. We extend our sincere thanks to all experts for giving introductory comments in the chapters, something which we feel will motivate the reader to study the topic. We also wish to thank the following reviewers who took out time to review the book. Their names are given below.

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|----------------------------|---|
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Suggestions and feedback to improve the text will be highly appreciated. Please feel free to write to us at anandbevoor@rediffmail.com and kulkarnivinay@rediffmail.com.

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