

Engineering Metrology I C Gupta Book

Engineering Metrology and Measurements is a textbook designed for students of mechanical, production and allied disciplines to facilitate learning of various shop-floor measurement techniques and also understand the basics of mechanical measurements.

Maximizing reader insights into the key scientific disciplines of Machine Tool Metrology, this text will prove useful for the industrial-practitioner and those interested in the operation of machine tools. Within this current level of industrial-content, this book incorporates significant usage of the existing published literature and valid information obtained from a wide-spectrum of manufacturers of plant, equipment and instrumentation before putting forward novel ideas and methodologies. Providing easy to understand bullet points and lucid descriptions of metrological and calibration subjects, this book aids reader understanding of the topics discussed whilst adding a voluminous-amount of footnotes utilised throughout all of the chapters, which adds some additional detail to the subject. Featuring an extensive amount of photographic-support, this book will serve as a key reference text for all those involved in the field.

Effective from 2008-09 session, U.P.T.U. has introduced the subject of manufacturing processes for first year engineering students of all streams. This textbook covers the entire course material in a distilled form.

Engineering Metrology and Measurements OUP India

Knowledge of measurement and instrumentation is of increasing importance in industry. Advances in automated manufacturing and requirement to conform to various standards have resulted in a large number of computerised and automated inspection techniques along with the classical metrology methods. Manufacturers have to find new ways of ensuring that the quality of their products and processes remains the best in the global market. The best way for the engineering sector to compete against industrialised nations is to focus on high-quality, value-added engineering. Principles of Engineering Metrology explains the salient features in dimensional metrology as per IS and ISO standards methods. It explains in detail the applications of form, position and orientation of various features with mathematical background and a good number of illustrations. The book is targeted as a guide to practicing engineers in dimensional metrology and students of mechanical engineering and production engineering. Dimensional metrology laboratories engaged in consultancy, as well as machining shops, and assembly units of mechanical components will also find this book useful. It will also be suitable to machine tool shops for preliminary studies.

Advances in engineering precision have tracked with technological progress for hundreds of years. Over the last few decades, precision engineering has been the specific focus of research on an international scale. The outcome of this effort has been the establishment of a broad range of engineering principles and techniques that form the foundation of precision design. Today's precision manufacturing machines and measuring instruments represent highly specialised processes that combine deterministic engineering with metrology. Spanning a broad range of technology applications, precision engineering principles frequently bring together scientific ideas drawn from mechanics, materials, optics, electronics, control, thermo-mechanics, dynamics, and software engineering. This book provides a collection of these principles in a single source. Each topic is presented at a level suitable for both undergraduate students and precision engineers in the field. Also included is a wealth of references and example problems to consolidate ideas, and help guide the interested reader to more advanced literature on specific implementations.

Mc-Graw Hill Education is proud to announce the fourth edition of Manufacturing Technology, Volume 2 on Metal cutting and Machine Tools, by our well-known author P N Rao. With latest industrial case studies and expanded topical coverage, the textbook offers a deep knowledge of the ever-evolving subject. A dedicated section on chapter-wise GATE questions provide support to the competitive examinations' aspirants. This revised edition also maintains its principle of lucid presentation and easy to understand pedagogy. This makes the book a complete package on the subject which will greatly benefit students, teachers and practicing engineers. Salient Features: - Well organised description of equipment, from practical information to its process, supported with easy to understand illustrations, numerical calculation and discussion of the result. - Expanded topical coverage by adding One new chapter, on Micro-Manufacturing. Included new required topics like, Automation, Economics of Tooling, etc. - Latest Industrial Case Studies, like Turbine Blade Machining, Welding Fixture, etc.

This second edition of Mass Metrology: The Newly Defined Kilogram has been thoroughly revised to reflect the recent redefinition of the kilogram in terms of Planck's constant. The necessity of defining the kilogram in terms of physical constants was already underscored in the first edition. However, the kilogram can also be defined in terms of Avogadro's number, using a collection of ions of heavy elements, by the levitation method, or using voltage and watt balances. The book also addresses the concepts of gravitational, inertial and conventional mass, and describes in detail the variation of acceleration due to gravity. Further topics covered in this second edition include: the effect of gravity variations on the reading of electronic balances derived with respect to latitude, altitude and earth topography; the classification of weights by the OIML; and maximum permissible error in different categories of weights prescribed by national and international organizations. The book also discusses group weighing techniques and the use of nanotechnology for the detection of mass differences as small as 10-24 g. Last but not least, readers will find details on the XRCD method for defining the kilogram in terms of Planck's constant.

The present multicolor edition has been thoroughly revised and brought up-to-date. Multicolor pictures have been added to enhance the content value and to give the students an idea of what he will be dealing in reality, and to bridge the gap between theory and practice. This book has already been included in the 'suggested reading' for the A.M.I.E. (India) examinations.

Introduces Emerging Engineering Materials Mechanical, materials, and production engineering students can greatly benefit from Engineering Materials: Research, Applications and Advances. This text focuses heavily on research, and fills a need for current information on the science, processes, and applications in the field. Beginning with a brief overview, the book provides a historical and modern perspective on material science, and describes various types of engineering materials. It examines the industrial process for emerging materials, determines practical use under a wide range of conditions, and establishes what is needed to produce a new generation of materials. Covers Basic Concepts and Practical Applications The book consists of 18 chapters and covers a variety of topics that include functionally graded

materials, auxetic materials, whiskers, metallic glasses, biocomposite materials, nanomaterials, superalloys, superhard materials, shape-memory alloys, and smart materials. The author outlines the latest advancements, including futuristic plastics, sandwich composites, and biodegradable composites, and highlights special kinds of composites, including fire-resistant composites, marine composites, and biomimetics. He also factors in current examples, future prospects, and the latest research underway in materials technology. Contains approximately 160 diagrams and 85 tables Incorporates examples, illustrations, and applications used in a variety of engineering disciplines Includes solved numerical examples and objective questions with answers Engineering Materials: Research, Applications and Advances serves as a textbook and reference for advanced/graduate students in mechanical engineering, materials engineering, production engineering, physics, and chemistry, and relevant researchers and practicing professionals in the field of materials science.

Applied Metrology for Manufacturing Engineering, stands out from traditional works due to its educational aspect. Illustrated by tutorials and laboratory models, it is accessible to users of non-specialists in the fields of design and manufacturing. Chapters can be viewed independently of each other. This book focuses on technical geometric and dimensional tolerances as well as mechanical testing and quality control. It also provides references and solved examples to help professionals and teachers to adapt their models to specific cases. It reflects recent developments in ISO and GPS standards and focuses on training that goes hand in hand with the progress of practical work and workshops dealing with measurement and dimensioning.

Providing a comprehensive introduction to the basics of Internal Combustion Engines, this book is suitable for: Undergraduate-level courses in mechanical engineering, aeronautical engineering, and automobile engineering. Postgraduate-level courses (Thermal Engineering) in mechanical engineering. A.M.I.E. (Section B) courses in mechanical engineering. Competitive examinations, such as Civil Services, Engineering Services, GATE, etc. In addition, the book can be used for refresher courses for professionals in auto-mobile industries.

Coverage Includes Analysis of processes (thermodynamic, combustion, fluid flow, heat transfer, friction and lubrication) relevant to design, performance, efficiency, fuel and emission requirements of internal combustion engines. Special topics such as reactive systems, unburned and burned mixture charts, fuel-line hydraulics, side thrust on the cylinder walls, etc. Modern developments such as electronic fuel injection systems, electronic ignition systems, electronic indicators, exhaust emission requirements, etc. The Second Edition includes new sections on geometry of reciprocating engine, engine performance parameters, alternative fuels for IC engines, Carnot cycle, Stirling cycle, Ericsson cycle, Lenoir cycle, Miller cycle, crankcase ventilation, supercharger controls and homogeneous charge compression ignition engines. Besides, air-standard cycles, latest advances in fuel-injection system in SI engine and gasoline direct injection are discussed in detail. New problems and examples have been added to several chapters. Key Features Explains basic principles and applications in a clear, concise, and easy-to-read manner Richly illustrated to promote a fuller understanding of the subject SI units are used throughout Example problems illustrate applications of theory End-of-chapter review questions and problems help students reinforce and apply key concepts Provides answers to all numerical problems

Land and water, the two crucial natural resources for agriculture, are decreasing as a result of burgeoning population of the country. At the same time, various forms of degradation are taking a toll on the productivity of these resources so much so that large areas have been taken out of plough. Current assessment reveal that already 6.73 million ha area has gone out of cultivation because of excessive salts or high sodicity and this area is likely to expand to 20 million ha by 2050 because of the faulty irrigation and drainage water management practices being adopted in irrigation commands. Of the current affected area, more than 50% is sodic in nature, which requires some kind of chemical amendment for reclamation. While our knowledge and understanding of the causes, nature and harmful effects of sodic soils have tremendously increased, availability of gypsum on account of environmental problems on its mining has caused concerns. Apparently, there is a need to push for other amendments especially the industrial wastes and publish the information in practical terms for various stakeholders. This book is an attempt in this direction. Taking into account the widely varying needs of the clients, the chapters of this book have been organized to include history, origin and genesis of sodic lands, basic principles of diagnosis, nature and properties of sodic lands, amendments, reclamation package and alternate land management. Since sodic water irrigation is one of the factors in the formation of sodic lands, a separate chapter deals with this issue highlighting the extent and distribution, chemical characteristic and management options for the use of sodic water. The economic analysis procedures and socio-economic issues of sodic land reclamation are included in a separate chapter with appropriate case studies. Since latest scientific information on new technologies with case studies is included, we believe that this book is an improvement over the existing books and is a useful addition to the literature on this subject. In our view the information contained in this book would be handy to field practitioners in the Government Departments and NGOs to plan and undertake large sodic land reclamation projects. Since the basic principles and practices have been very well elucidated, the book can be used as a text book in agricultural and engineering colleges. It can also be used as a source material in training programs being organized by various scientific organizations. We believe that the book would prove to be a handy reference resource to all those interested in sustainable irrigated agriculture for the food and nutritional security of the nation.

Revised extensively, the new edition of this text conforms to the syllabi of all Indian Universities in India. This text strictly focuses on the undergraduate syllabus of Design of Machine Elements I and II, offered over two semesters.

The book is meant for B.E./B.Tech. students of different universities of India and abroad. It contains all basic material required at undergraduate level. The author has included "Examination questions" from several Indian Universities as solved examples. The sections on "Descriptive Questions" and "Multiple Choice Questions" contains the theory type examination questions and objective questions respectively.

An international conference attended by scientists and engineers from six of the world's leading natural producers of minerals and metals. The emphasis is on the application of measurements including problems and their solution, within the gold, platinum and diamond producing industries. There are also papers by researchers from the steel industry which provide a valuable insight into measurement application in metal processing.

Non-renewable materials can no longer be disposed once humankind's ever increasing needs cannot be fulfilled anymore due to limited resources. Reuse and recycling become inevitable requirements for product and process design. Renewable resources must not be consumed in quantities higher than can be regained. New technologies have to be developed and applied for a Sustainable Product Development and Life Cycle Engineering to fulfill the needs of humankind, protecting public health, welfare, and environment. The 8th Global Conference on Sustainable Manufacturing brings together some of the world's leading experts to present a scientific conference in Abu Dhabi, one of the world's fastest growing economies and a global leader in the development of sustainable technologies. The conference will focus on 7 areas: Value adding by sustainable manufacturing in the UAE Potentials of renewables Education for sustainability engineering Green supply chain and transportation Microelectronics and resource efficiency Technology driven startups

Sustainable products and manufacturing processes

Modern Machining Processes presents unconventional machining methods which are gradually commercial acceptance. All aspects of mechanical, electrochemical and thermal processes are comprehensively covered. Processes like Abrasive Jet Machining Water Jet Machining Laser Beam Machining Hot Machining Plasma Arc Machining have also been included. It gives a balanced account of both theory and applications, contains illustrative exercises and an extensive up-to-date bibliography. The book should be useful to students of production and mechanical engineering, as well as practising engineers.

This book presents the select proceedings of the International Conference on Functional Material, Manufacturing and Performances (ICFMMP) 2019. The book covers broad aspects of several topics involved in the metrology and measurement of engineering surfaces and their implementation in automotive, bio-manufacturing, chemicals, electronics, energy, construction materials, and other engineering applications. The contents focus on cutting-edge instruments, methods and standards in the field of metrology and mechanical properties of advanced materials. Given the scope of the topics, this book can be useful for students, researchers and professionals interested in the measurement of surfaces, and the applications thereof.

"The Measurement Quality Division, ASQ."

The 'Maintenance and Work Simplification' will certainly enrich the book regarding the maintenance planning. A major emphasis has been given at every step to furnish figures which may be easily understandable and reproducible by the students.

For the experienced manufacturing professional, the book offers a review of inspection and measurement concepts, and some new insights into the subject. For those new to inspection and measurement, the text will help them grasp the technology involved and the methods for effectively planning applications.

With design of products changing frequently, and functional requirements becoming more demanding, batch production of high precision components has become a necessity. The advent of NC and CNC has enabled automation of batch manufacturing supported by computerisation of manufacturing systems. The book is a complete reference consisting of several technologies associated with modern automated manufacturing.

A variety of industries – information technology, aerospace, automobile, and basic and new materials manufacturing – need technological innovations, which bring high-value-added and high-quality products at low cost not only because of global competition, but also because of the perspective of environmental consciousness and regulation. Thermophysical properties of high-temperature melts are indispensable for numerical simulations of material processes such as semiconductor and optical crystal growth of the melt, and casting of super-high-temperature alloys for jet-engine turbine blades, in addition to welding in automobile manufacturing. Recent developments in process modeling provide 3D unsteady analysis of melt convection, temperature, and heat flux distribution, which enables us to predict product quality. In fact, 3D process visualization using computer modeling helps us to understand complicated phenomena occurring in the melt and to control the process. Accurate data are necessary to improve the modeling, which collectively engenders high-quality products. However, crucial obstacles render measurements of thermophysical properties difficult at elevated temperatures because of high chemical reactivity and fluidity of melts. Substantial and persistent challenges have been made to ascertain the precise thermophysical properties of high-temperature melts. This book describes the new techniques and latest developments in the measurements of atomic structure, density, surface tension, viscosity, heat capacity, thermal and mass diffusivity, thermal conductivity, emissivity, and electrical conductivity of high-temperature melts. In addition to up-to-date improvements in conventional techniques, some new attempts are introduced to open a new scientific field, that is, physics of high-temperature melts.

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