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Contents

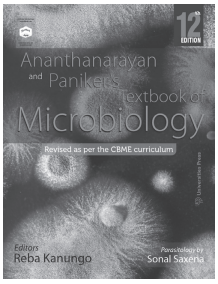
BIOTECHNOLOGY

Ananthanarayan and Paniker's Textbook of Microbiology
REVISED EDITION

(Twelfth Edition)

Editors: Reba Kanungo
Adjunct Professor of Microbiology, Kasturba Medical College (KMC), Mangalore, at Manipal Academy of Higher Education (MAHE), and former Dean of Research and Professor and Head of the Department of Microbiology, Pondicherry Institute of Medical Sciences (PIMS), Puducherry, India

Sonal Saxena (for Parasitology)
Director–Professor and Head, Department of Microbiology, Maulana Azad Medical College (MAMC), New Delhi; WHO fellow on Antimicrobial Resistance; Joint Secretary, Indian Association of Medical Microbiologists (IAMM) and Ex-Secretary, IAMM, Delhi, India



Online resources available

The 12th edition of Ananthanarayan and Paniker's Textbook of Microbiology has been revised extensively in keeping with the approach prescribed by the National Medical Council of India in the new Competency-based Medical Education (CBME) curriculum, which is aimed at integrating microbiology into a system-based approach to human disease. This new edition is also better suited for the shorter course duration.

The basic principles of infectious diseases and their control within the hospital and the community have been elucidated in the initial chapters. The section on 'General Microbiology' provides an overview of the major microorganisms associated with human infections, while the section on 'Immunology' addresses aspects that can be applied to human health and disease. Up-to-date content on the recent advances in disease detection, molecular methods of diagnosis, quality control, infection prevention and control, public health and epidemiology, and preventive strategies, including national programmes, has been included. The third section, 'Microbiology as Applied to Infectious Diseases', which is aligned with the competencies prescribed by the National Medical Council of India, elaborately and comprehensively deals with infections in a system-wise manner. The pattern of discussion is uniform across syndromes, detailing the significant etiological agents of each system, their disease spectra, pathogenesis, clinical features and epidemiology and the approach to the laboratory diagnosis and treatment of each of the clinical entities described. Each of the chapters in this section carries one or more tabular columns summarising the causative agents of the various syndromes of the respective organ system for easy reference and recall. The organisms listed in these tables are colour-coded in keeping with their relative etiological significance with respect to the organ system.

Online resources available at: www.universitiespress.com/AandPTBofMicrobiology12

Contents: PART I: General Microbiology ◆ History and Scope of Microbiology (MI1.1) ◆ Basic Concepts of Bacteriology (MI1.1–1.3) ◆ Systematic Bacteriology (MI1.1–1.3, 8.9–8.13) ◆ Basic Concepts of Virology (MI1.1–1.3, 8.3, 8.9–8.13) ◆ Basic Concepts of Mycology (MI1.1–1.3, 8.9–8.13) ◆ Basic Concepts of Medical Parasitology (MI1.1–1.3, 8.9–8.13) ◆ Microbial Genetics (MI1.1) ◆ Epidemiology of Infectious Diseases (MI1.3) ◆ Sterilisation and Disinfection (MI1.4 and 1.5) ◆ Antimicrobial Agents (MI1.6) ◆ Infection Control in Healthcare Settings (MI8.5–8.7) ◆ **PART II:** Immunology ◆ Immunological Mechanisms in Health (MI1.7) ◆ Antigens, Antibodies and the Complement System (MI1.7 and 1.8) ◆ Mechanisms of Immune Response (MI1.8) ◆ Laboratory Methods Used in the Detection of Immunological Response (Antigen–Antibody Reactions) (MI1.10) ◆ Hypersensitivity (MI1.10) ◆ Autoimmune Disorders and Immunodeficiency States (MI1.10) ◆ Immunological Mechanisms

of Transplantation, Immunohematology and Tumour Immunity (MI1.11) ◆ Immunoprophylaxis (MI1.9) ◆ **PART III:** Microbiology as Applied to Infectious Diseases ◆ Cardiovascular and Bloodstream Infections (MI2.1–2.6) ◆ Acquired Immunodeficiency Syndrome (AIDS) (MI2.7, 8.15 and 8.16) ◆ Infections of the Respiratory System (MI6.1–6.3) ◆ Central Nervous System Infections (MI5.1–5.3) ◆ Gastrointestinal Infections (MI3.1–3.8) ◆ Hepatobiliary Infections (MI3.7 and 3.8) ◆ Genitourinary and Sexually Transmitted Infections (MI7.2 and 7.3) ◆ Urinary Tract Infections (MI7.3) ◆ Skin, Soft Tissue and Musculoskeletal Infections (MI4.1–4.3) ◆ Infections of the Eyes and Ears and Congenital Infections (MI8.15) ◆ Zoonotic and Vector-Borne Infections (MI8.1) ◆ Opportunistic Infections (MI8.2) ◆ Emerging Infections (MI8.4) ◆ Oncogenic Viruses (MI8.3) ◆ National Health Programmes, Disease Detection and Reporting (MI8.16)

2022	**672 pp.**	**Paperback**
978–93–93330–01–7		**₹ 1250.00**

Bioinformatics and Bioprogramming in C

L N Chavali
Visiting faculty, Osmania University, Hyderabad

With the flood of information originating from genome sequencing projects, biology is being transformed from a laboratory-based science into an information science. Now, a stage has been reached where students and scholars of biology cannot study or carry out research in biology without using the tools of computers and bioinformatics—tools which an ordinary biologist may not be proficient in.

This book is designed to introduce C language to the biology, biochemistry, microbiology and biotechnology community as a tool for solving biological problems. To help in understanding the concepts, most of the terminology used is biocentric and the programs written help in real-life problems like gene sequence analysis and prediction. It moves gradually from simple ideas to more complex programming concepts, thus equipping the reader to comprehend the case studies on dynamic programming and PAM matrices included at the end.

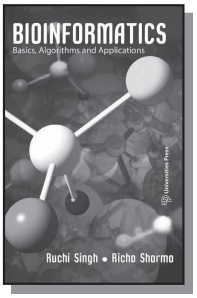
Contents: *Foreword* ◆ *Preface* ◆ *Acknowledgements* ◆ *Introduction* ◆ Basic Terminology ◆ Operators ◆ Statements and Control Flow ◆ Functions ◆ Character Input and Output ◆ Arrays ◆ Pointers ◆ Structures ◆ Files ◆ Data Structures ◆ Case Studies ◆ *Appendix* ◆ *Index*

2009	**224 pp.**	**Paperback**
978–81–7371–648–5		**₹ 715.00**

Bioinformatics: Basics, Algorithms and Applications

Ruchi Singh
Lecturer, Department of Bioinformatics, SRM University, Chennai

Richa Sharma
Professor and Head of Department, Department of Information Science and Engineering, The Oxford College of Engineering, Bangalore



Bioinformatics has been recognised and studied as a separate discipline only in the last decade. Being a multidisciplinary subject it requires knowledge of several subjects, such as molecular biology, biochemistry, computer science and others. Students in a bioinformatics course are from different academic backgrounds; those who have studied biology (i.e., botany, zoology, biochemistry, microbiology, etc.), will require an introduction to mathematics and computer science, while those with a background in physics, chemistry and mathematics will need explanations of biological principles.

This book provides a simple and concise explanation of the basic principles, tools and applications of bioinformatics. It explains

- subjects that are part of a conventional bioinformatics course, such as databases, database access and analyses tools
- principles of computer science that underlie the algorithms which are built into these tools.
- core algorithms of sequence analyses and

phylogeny construction.

Starting with a brief overview of biological terminology used frequently in bioinformatics, the contents are grouped into five sections:

- bioinformatics and algorithms
- databases and matrices
- alignment and comparison of sequences
- algorithms to analyse data
- applications of bioinformatics

The book has been planned and structured as an undergraduate textbook for the one-semester foundation course in bioinformatics. In order to make the book more useful for a wider section of students and teachers, the book has been kept concise and relevant, at the same time covering all important aspects. Care has been taken to design the algorithms such that even beginners can understand them without difficulty.

Contents: *Getting Started* ◆ *Introduction* ◆ Introduction to bioinformatics ◆ Introduction to algorithms ◆ Databases and Matrices ◆ Biological databases ◆ Database searching ◆ Scoring matrices ◆ Sequence Alignment ◆ Pairwise sequence alignment ◆ Multiple sequence alignment ◆ Phylogenetic analysis ◆ Other Bioinformatics Algorithms ◆ Basic algorithms ◆ Graph algorithm ◆ String algorithm ◆ Applications of Bioinformatics ◆ Transcriptomics ◆ Metabolomics ◆ Pharmacogenomics ◆ Combinatorial synthesis ◆ Genomics ◆ Proteomics ◆ *Bibliography* ◆ *Index*

2010	**272 pp.**	**Paperback**
978–81–7371–713–0		**₹ 715.00**

Cell Biology

Channarayappa
Professor and Head, M S Ramaiah Institute of Technology, Bengaluru, India

Cell Biology covers one of the most fundamental and elaborately studied areas of biology: the cell. The cell is the basic unit of life and has all the structural and functional properties required for life. *The book has been divided intoz 20 chapters—beginning with the origin of biological systems and ending with tools for the study of cells.* Every effort has been made to include the most recent information. Each chapter is provided with an adequate number of illustrations.

This book can serve as a basic textbook for students of molecular biology, genetics, biochemistry, agriculture and biotechnology, or as a reference book for those interested in learning the fundamentals of cell biology, in particular, the origin, organisation and functions of subcellular components and cell types.

Contents: Origin of Biological Systems ◆ Atomic Basis of Life ◆ Biomolecules ◆ Prokaryotic Cells ◆ Eukaryotic Cells ◆ Biological Membranes ◆ Mitochondria: Powerhouse of the Cell ◆ Plastids: Food Factory of the Cell ◆ Cell Division: Propagation of Genetic Information ◆ Cell Signalling ◆ Sensory Signalling ◆ Differentiation and Development ◆ Building Multicellular Organisms ◆ Cytoskeleton and Cell Motility ◆ Growth, Sexual Reproduction and Ageing ◆ Cell Death and Cell Renewal ◆ Plant Growth and Development ◆ Immune Response ◆ Non-Cellular Life Forms ◆ Tools for the Study of Cells ◆ *Index*

2010	**624 pp.**	**Paperback**
978–81–7371–716–1		**₹ 1,500.00**

Concepts in Biotechnology

D Balasubramanian, C F A Bryce,K Dharmalingam, J Green & Kunthala Jayaraman (Eds)

The book covers the fundamental principles and concepts in biotechnology which form the basis for the subject and illustrates their applications in selected areas such as health care, agriculture, animal systems, bioprocess technologies and environmental aspects. This textbook is the outcome of a COSTED-IBN project on curriculum development in biotechnology for undergraduate study. It is designed to provide a strong base in this emerging, interdisciplinary are which holds great promise for economic development. This revised edition incorporates two new chapters on biotechnology in food and beverage production and environmental biotechnology.

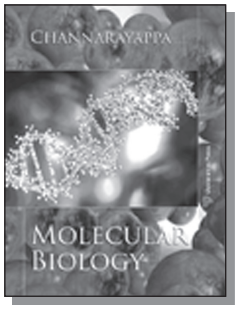
Contents: About ICSU and COSTED-IBN ◆ *Preface to the Second Edition* ◆ *Foreword* ◆ *Acknowledgements* ◆ How to use this book ◆ From cell biology to biotechnology - D Balasubramanian ◆ Interplay of macromolecules in a living cell - A Pena ◆ Structural and functional dynamic of the cell – G E Herve ◆ Gene Structure and Expression – A C Robinson, L L Kisselev ◆ Gene technology - Kunthala Jayaraman, M Sritharam ◆ Protein engineering and design - V Pattabhi, N Gautham ◆ Enzyme technology - D Thomas, J M Laval ◆ Bioprocess technology:

Exploitation of micro-organisms for the production of chemicals - J Green, M El-Mansi ◆ Bioprocess technology: Exploitation of animal cells - A Fiechter ◆ Immunotechnology – G P Talwar, R Raghupathy, S K Gupta, V Bal ◆ Biotechnology as a new frontier in health – M G Deo, R Mulherkar ◆ Plant biotechnology - K Dharmalinga, K Veluthambi ◆ Biotechnology in livestock Production – K C Reed, G A Smith ◆ Biotechnology in food and beverage production ◆ Environmental biotechnology ◆ Bio-informatics and pattern recognition in DNA and protein sequences – G I Bell, M El-Mansi ◆ Marine biotechnology – R R Colwell, R T Hill ◆ Impact of biotechnology on the sustainability of the environment – F W G Baker ◆ Biotechnology, international competition, and economic, ethical and social implications in developing countries – D R J Macer ◆ *Contributors and editors* ◆ *Glossary* ◆ *Index*

2004 **516 pp.** **Paperback**
978–81–7371–483–2 **₹1,230.00**

Molecular Biology

Channarayappa
Professor and Head, M S Ramaiah Institute of Technology, Bengaluru, India



The study of molecular biology has widespread applications covering genetic research, drug delivery systems, stem cell therapy and cancer treatment. The functioning of biological systems is based on the flow of genetic information from the nucleotides of the DNA to the RNA leading to the production of various cellular proteins. Thus, control is exercised only by modifying the various stages of protein synthesis. Hence, the ideal approach to the study of the subject is in understanding the genetic processes that are reflected as changes in protein reactions.

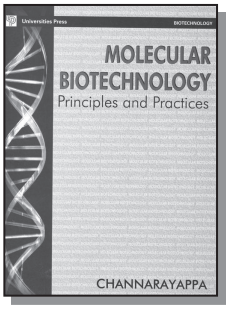
This book is a comprehensive overview of the subject and is written in a clear and simple language. It also incorporates several student-friendly features. There are numerous illustrations and tables that will enable the readers to grasp the concepts easily. Each chapter begins with Learning Objectives and includes Key Points and Self-assessment Questions. The Further Reading section guides the students towards advanced discussion of the topics. It is hoped that the book will be a valuable textbook to students of biotechnology, genetics and other courses which have molecular biology as a component.

Contents: Introduction to Molecular Biology ◆ The Cell: Structure and Functions ◆ Chemistry of Cells ◆ Basic Rules of inheritance ◆ Nucleic Acids ◆ Structure and Organisation of Genome ◆ The Cell Cycle ◆ DNA Replication ◆ Transcription ◆ RNA Processing ◆ Genetic Code ◆ Translation: Decoding the Genetic information ◆ Protein Processing and Transportation ◆ Regulation of Gene Expression in Prokaryotes ◆ Regulation of Gene Expression in Eukaryotes ◆ Epigenetic Regulation ◆ Genetic Recombination ◆ Mobile Elements: Drivers of Genome Evolution ◆ Mutagenesis and DNA Repair ◆ Molecular Biology of Cancer ◆ *Index*

2015 **508 pp.** **Paperback**
978–81–7371–946–2 **₹1315.00**

Molecular Biotechnology: Principles and Practices

Channarayappa
HOD, Department of Biotechnology, M S Ramaiah Institute of Technology, Bengaluru



The book is intended as a textbook aimed at providing undergraduate and postgraduate students with a strong base in this emerging and highly promising interdisciplinary science. It strikes a balance between two important aspects of the science—the theory of molecular biology

and the experimental approach to the study of biological processes. The main feature of this book is that it covers a wide range of molecular techniques in biotechnology and is designed to be a student- and teacher-friendly textbook. Each technique is described conceptually, followed by a detailed experimental account of the steps involved. The book can also serve as reference to the interested reader who is venturing into the field of biotechnology for the first time.

Special Features: Provides comprehensive and up-to-date coverage of key concepts in biotechnology ◆ Logical format used to provide easy access to the information ◆ Clear and well-labelled figures ◆ Extensive cross-referencing between chapters

Contents: **PART I: Introduction to Biotechnology** ◆ Biotechnology: Scope and Importance ◆ Biosafety and Good Laboratory Practices **PART II: Advanced Techniques in Molecular Biology** ◆ Techniques of Cell Fractionation and Centrifugation ◆ Chemical Synthesis of Nucleic Acids ◆ DNA Chip Technology and its Potential Applications ◆ Bioinformatics in Biotechnology **PART III: Working with Nucleic Acids** ◆ Isolation of Nucleic Acids ◆ Measuring Nucleic Acid Concentration and Purity ◆ Electrophoretic Techniques ◆ DNA Sequencing ◆ Genetic Maps and Marker Analysis ◆ Polymerase Chain Reaction (PCR) ◆ In Situ Hybridization **PART IV: Recombinant DNA and Genetic Engineering** ◆ Fundamentals of Recombinant DNA Technology ◆ Enzymes in Molecular Cloning ◆ Gene Constructs and Cloning Vectors ◆ DNA Libraries ◆ Molecular Biology of Gene Transfer Systems ◆ Selection and Screening of Recombinant Molecules ◆ **PART V: Applications of Biotechnology** ◆ Genetic Engineering of Microorganisms ◆ Genetic Engineering of Animals ◆ Genetic Engineering in Plants ◆ **PART VI: Working with Proteins** ◆ Protein Purification Techniques ◆ Protein Detection and Estimation ◆ Protein Fractionation Techniques ◆ Immunochemical Techniques ◆ **PART VII: Bacterial and Mammalian Cell Culture** ◆ Biology of Bacteria ◆ Cultivation of Mammalian Cells In vitro ◆ **PART VIII: In Vitro Plant Cell Culture and Crop Improvement** ◆ Plant Cell Culture Laboratory and Requirements ◆ Plant Culture Media, Preparation, and Culture Initiation ◆ Micropropagation ◆ Cultures of Organized Tissues ◆ Culture of Unorganized Tissues ◆ Cryopreservation and Distribution of Clonal Material ◆ Measurement of Plant Cell Growth ◆ **PART VIII: Cytological Analysis** ◆ Protoplast Fusion and Somaclonal Variation ◆ Application of Plant Cell, Tissue and Organ Culture ◆ **PART IX: Environmental Biotechnology** ◆ Biotechnology in Pollution Control ◆ Biodiversity and Genetic Conservation ◆ Bioenergy Fuel from Biomass ◆ Regulatory Aspects of Using Genetically-Modified Organisms ◆ Intellectual Property Rights and Socio-Legal Aspects of Biotechnology ◆ *Appendices*

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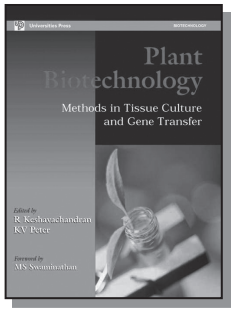
2006	**1228 pp.**	**Paperback**
978–81–7371–501–3		**₹ 1,995.00**

Plant Biotechnology: Methods in Tissue Culture and Gene Transfer

R Keshavachandran (Ed)
Professor, Centre for Plant Biotechnology and Molecular Biology, and Coordinator, Bioinformatics Centre, Kerala Agricultural University, Thrissur

K V Peter (Ed)
Professor of Horticulture and Former Vice–Chancellor, Kerala Agricultural University, Thrissur



There is growing demand for more food crops. Agricultural yield is however challenged by two concerns: availability of arable land and reduced water resources for irrigation. Biotechnology offers several tools that can be used appropriately for sustainable agriculture. Recent advances in molecular biology and recombinant DNA technology can make increased production and pest resistant crops with increased nutritive value a reality. The book has 21 chapters contributed by eminent scientists from all over the country. It discusses the various techniques and aspects of biotechnology that can bring about crop improvement. The book serves as a textbook for postgraduate students and researchers working in

the fields of plant biotechnology and horticulture and a reference book for undergraduates.

Contents: Biotechnology in Indian Agriculture: *R Keshavachandran and KV Peter* ◆ The Cell Biology of Plant Cell Culture and Development: *K Nirmal Babu, SP Geetha, A Anu,* D *Minoo and V Sumathi* ◆ Hormonal Regulation of *In Vitro* Morphogenesis: *PA Nazeem and PS Smitha* ◆ Maintenance of Asepsis in Tissue Culture: *D Girija* ◆ Micropropagation—Principles and Practices: *R Keshavachandran and Sandhya Sudhan* ◆ Media Requirements of *In Vitro* Culture: *R Keshavachandran and Sandhya Sudhan* ◆ Haploid Production: *JB Mythili and Pious Thomas* ◆ Triploid Production: *Pious Thomas and JB Mythili* ◆ *In Vitro* Pollination and Fertilization:*NS Rangaswamy and KR Shivanna* ◆ Embryo Culture: *K Rajmohan* ◆ Protoplast Isolation and Culture: *Pratap Kumar Pati, Madhu Sharma and Paramvir Singh Ahuja* ◆ Somatic Hybridization: *Pratap Kumar Pati, Madhu Sharma and Paramvir Singh Ahuja* ◆ *In Vitro* Selection with Plant Cell, Tissue and Organ Cultures: *P Vidhyasekaran* ◆ Synthetic Seeds: *P Suprasanna, TR Ganapathi, VA Bapat and PS Rao* ◆ Methods of Genetic Transformation in Plants: *KC Bansal, R Keshavachandran and Sandhya Sudhan* ◆ Germplasm Storage: *Rekha Chaudhury and SK Malik* ◆ GM Technology and Biosafety Regulations: *Renu Swarup* ◆ Patents in Biotechnology: *Malathi Lakshmikumaran, Shilpi Bhattacharya and Nilanjana Sensarkar* ◆ Molecular Markers and their Applications in Plant Species:*Malathi Lakshmikumaran, V Sabharwal, N Chauhan and MS Negi* ◆ Useful Genes for Plant Genetic Engineering: *P Rajendran* ◆ Biotechnology in the Conservation of Medicinal and Aromatic Plants: *S Natesh*

2008	**312 pp.**	**Paperback**
978–81–7371–616–4		**₹ 870.00**

Practical Biotechnology: Methods and Protocols

S Janarthanan
Senior Lecturer, Department of Zoology, Thiagarajar College, Madurai

Vincent
Reader, Department of Advanced Zoology and Biotechnology, Loyola College, Chennai

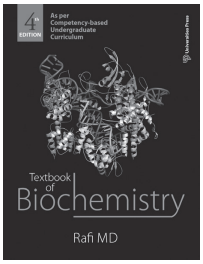
The book helps undergraduate, postgraduate and research students to perform basic experiments in biotechnology. The laboratory protocols are simple to understand by students from different scientific backgrounds. Each laboratory exercise contains an introductory unit, protocol and easy-to-follow instructions for reagent preparation. The methods and protocols given here aim to make students ready for independent research in biotechnology laboratories.

Contents: DNA ISOLATION - Isolation of Plasmid DNA ◆ Isolation of Bacterial Genomic DNA ◆ Isolation of Yeast Genomic DNA ◆ Isolation of Fungal Genomic DNA ◆ Isolation of Genomic DNA from Blood ◆ Isolation of DNA from Animal Cells ◆ Isolation of Genomic DNA from Eukaryotic Tissues ◆ Isolation of Plant DNA using CTAB Extraction Method ◆ Isolation of Chloroplast DNA ◆ Mitochondrial DNA Isolation / Phenol Chloroform Extraction of DNA ◆ Ethanol Precipitation of DNA ◆ RNA ISOLATION - Isolation of Total RNA from Bacterial Cells ◆ Isolation of Total RNA from Plant Tissues ◆ Hot Phenol Isolation of RNA from Plant Tissues ◆ Acid Phenol Extraction of RNA ◆ Messenger RNA Isolation or Poly (A) RNA Isolation ◆ WORKING WITH DNA - Storage ◆ Purification ◆ Concentration ◆ Spectrophotometric Determination of Nucleic Acid Purity and Concentration ◆ Fluorescent Quantification of DNA ◆ Quantification of DNA using Diphenylamine (DPA) Assay ◆ MOLECULAR BIOLOGY METHODS - Restriction Enzyme Digestion of DNA ◆ DNA Ligation ◆ Agarose Gel Electrophoresis of DNA ◆ Elution of DNA Fragments from Agarose ◆ Phenol Purification of DNA from Low Melting Agarose ◆ Southern Blotting ◆ Agarose Gel Electrophoresis of RNA ◆ Northern Blotting ◆ Cloning ◆ Polymerase Chain Reaction (PCR)(In Vitro Amplification of DNA) ◆ SDS–Polyacrylamide Gel Electrophoresis ◆ Western Blotting (Immunoblotting) ◆ Iso-electric Focusing (IEF) of Proteins ◆ 2D Gel Electrophoresis (2D PAGE) ◆ Trypsin Digestion of Protein Gel ◆ Protein Dialysis ◆ Enzyme (Esterase) Gel Electrophoresis ◆ SOME USEFUL INFORMATION FOR METHODS IN MOLECULAR BIOLOGY - Antibiotic Concentration in Media ◆ E. coli Growth Curve ◆ Storage of Bacterial Strains in Stab Agar ◆ Storage of Bacterial Strains in Glycerol Solution ◆ Decontamination of Ethidium Bromide (EtBr) Solutions ◆ Preparation of Solutions ◆ Glassware and Plasticware ◆ Disposal of Buffers and Chemicals ◆ Autoclave Operating Procedures ◆ Safety Procedures ◆ PREPARATION OF SOLUTIONS ◆ *References*

2007	**136 pp.**	**Paperback**
978–81–7371–582–2		**₹ 450.00**

Textbook of Biochemistry
(Fourth Edition)

Rafi MD
Dean and Medical Director, Surabhi Institute of Medical Sciences, Siddipet, India



Online resources available

The fourth edition of *Textbook of Biochemistry* is a comprehensive introduction to the basic concepts of biochemistry for undergraduate students of medicine. It covers all the topics and core competencies specified by the MCI in its 'competency-based undergraduate curriculum' effective from August 2019. The topics are developed in a manner that encourages students to think analytically as opposed to memory-based learning. Links between biochemistry and other medical subjects provided throughout the book help to reinforce this approach. A consistent feature of the book is the liberal use of illustrations, tabular layouts and highlighted text, which makes the assimilation and recall of the inherently complex aspects of biochemistry easy.

In this edition, descriptions of topics which may fall under the category of additional reading have been set off from the regular text in a smaller font size to distinguish them from the essential content. The chapter-end exercises comprising review questions, MCQs, case studies, riddles and other problems will further enhance the revision experience. The problems-based exercises and case studies often reveal additional insights on the core concepts covered in the book.

Online resources available at: www.universitiespress.com/TextbookOfBiochemistry

Contents: **Prelude** — Molecular and Functional Organisation of Life ◆ Learning Biochemistry ◆ The Cell and Biological Membranes: Structure and Function ◆ **Molecules of Life** ◆ Carbohydrates ◆ Lipids d Amino Acids and Proteins d Nucleotides and Nucleic Acids ◆ Enzymes ◆ Vitamins ◆ **Physiological Biochemistry** ◆ Biochemistry of Blood ◆ Hemoglobin: Chemistry of Respiration ◆ Heme Synthesis and Degradation ◆ Digestion and Absorption d **Metabolism** ◆ A Journey into Metabolism ◆ Central Metabolism: Biological Oxidation ◆ Metabolism of Carbohydrates ◆ Metabolism of Lipids ◆ Metabolism of Amino Acids ◆ Metabolism of Nucleotides ◆ Integration of Metabolism ◆ Metabolism of Xenobiotics: Detoxification ◆ **Nutrition** ◆ Minerals ◆ Principles of Nutrition ◆ **Clinical Biochemistry** ◆ Water and Electrolytes ◆ Acid–Base Balance ◆ Organ Function Tests ◆ Biochemistry of Cancer ◆ **Molecular Biology** ◆ DNA Metabolism ◆ RNA Metabolism ◆ Protein Biosynthesis ◆ Regulation of Gene Expression ◆ **Biotechnology and Immunology** ◆ Recombinant DNA Technology ◆ Molecular Biology Techniques ◆ Biochemical Techniques ◆ Immunochemistry ◆ **Biochemical Perspective of Endocrinology** ◆ Hormone Action ◆ Hypothalamic and Pituitary Hormones ◆ Thyroid Hormones ◆ Hormones of the Adrenal Gland ◆ Hormones of the Gonads ◆ Hormones of the Pancreas and Diabetes Mellitus ◆ **Contemporary Topics** ◆ Extracellular Matrix ◆ Reactive Oxygen Species and Antioxidants ◆ Biochemical Genetics ◆ Environmental Pollutants, Toxins and Biomedical Waste Management ◆ Human Genome Project and Bioinformatics ◆ Gene Therapy ◆ Key to MCQs ◆ *Appendix: Reference Values and Interpretation of Biochemical Parameters for Ready Clinical Reference* ◆ *Index*

2020	820 pp.	Paperback
978–93–89211–19–1		₹ 1,395.00

Chemistry

Analytical Chemistry

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K Varaprasad Rao
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C Sudhakar
Lecturer in Chemistry, New Government Degree College, Khairatabad, Hyderabad, India

This book deals with the principles and applications of analytical chemistry, and *is useful for B.Sc. chemistry students and those working in analytical research laboratories of drug, pesticide and other chemical industries*. The topics discussed include the procedures to be followed in analytical work, solvent extraction as a technique in the isolation and purification of compounds, and chromatographic techniques (TLC, column, paper, ion-exchange, and HPLC) that are used for identification, purification, quantitative analysis and for monitoring the progress of reactions.

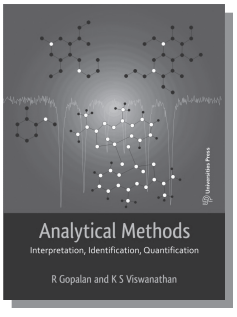
Contents: *Preface* ◆ Evaluation of Analytical Data ◆ Separation Methods: Solvent Extraction ◆ Separation Methods: Chromatography ◆ Instrumental Methods of Analysis: UV-Visible Spectroscopy ◆ Analysis of Water ◆ *Index*

2001	216 pp.	Paperback
978–81–7371–385–9		₹ 650.00

Analytical Methods: Interpretation, Identification and Quantification

R Gopalan
HOD, Department of Chemistry, Retd, MCC, Chennai

K S Viswanathan
HOD, Department of Chemistry, IISER, Mohali



The concepts that students learn in classrooms and the experiments they do in the laboratory are hardly ever integrated in the existing teaching methodology. This textbook on Analytical Methods is written with a view to addressing this lacuna. The main topics in analytical chemistry are dealt with—gravimetric analysis, volumetric analysis, separation and purification techniques, data analysis, thermoanalytical methods and various types of spectroscopy. Detailed discussions on new spectroanalytical techniques, polarimetry, laser techniques, Mössbauer spectroscopy and fluorescence spectroscopy are presented. The main objective is to introduce students to existing methods of analysis, new techniques, their instrumentation and mainly their applications, giving them an insight into this challenging and fascinating field. This book will serve as a text for students of M.Sc. chemistry. In addition, it can serve as a convenient reference for B.Sc. chemistry students and for candidates taking the UGC–CSIR NET examination.

Salient Features

- Spectra for all techniques are reproduced to give a feel of the actual output.
- Graphs and illustrations are provided along with block diagrams for each technique.
- Several worked out problems are provided for each technique that requires them.
- Exercises and problems are provided at the end of every chapter.

Preface ◆ Acknowledgements ◆ Introduction to Analytical Chemistry ◆ Analysis and Reporting of Data ◆ Separation and Purification Techniques ◆ Principles of Volumetric Analysis ◆ Principles of Gravimetric Analysis ◆ Thermoanalytical Methods ◆ Electroanalytical Methods ◆ Polarimetry

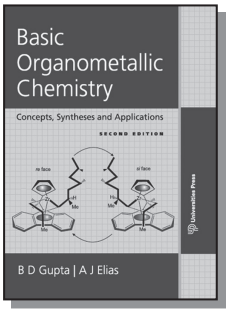
Spectroanalytical Techniques: Atomic Absorption Spectroscopy, Flame Emission Spectrometry ◆ Fluorescence Spectroscopy ◆ Infrared Spectroscopy ◆ Raman Spectroscopy ◆ Absorption Spectroscopy (UV–Vis Spectroscopy) ◆ Nuclear Magnetic Resonance Spectroscopy ◆ Electron Spin Resonance Spectroscopy ◆ Mass Spectrometry ◆ Laser Techniques ◆ Mössbauer Spectroscopy ◆ X-Ray Techniques ◆ Isotopic Analytical Methods ◆ Appendix List of Elements in the Increasing Atomic Numbers ◆ References ◆ Index

2018	596 pp.	Paperback
978–93–86235–57–2		₹ 1,095.00

Basic Organometallic Chemistry: Concepts, Syntheses and Applications
(Second Edition)

BD Gupta (Late)
Professor, Department of chemistry, IIT Kanpur

Anil J Elias
Professor, Department of chemistry, IIT Delhi



Online resources available

Organometallic chemistry is an integral part of every chemistry curriculum the world over, primarily because it bridges two main sub-disciplines of chemistry—inorganic and organic chemistry. This book

- covers a large variety of topics in detail;
- includes several new topics supplemented with relevant figures;
- is lavishly complemented with figures, equations and schemes for easy comprehension;
- includes carefully selected, updated and comprehensive references;
- provides a number of problems and exercises to test understanding; and provides detailed solutions to the problems as appendices;
- is useful for M.Sc chemistry students and researchers in many areas of chemistry.

Online resources available at:
www.universitiespress.com/
basicorganometallicchemistry

Contents: Chapter 1 Introduction ◆ What is organometallic chemistry? ◆ A brief history of organometallic chemistry ◆ Importance of organometallic compounds ◆ Supplementary reading ◆ **Chapter 2 The 18 Valence Electron Rule** ◆ Introduction ◆ The 18 electron rule ◆ Counting of electrons and finding metal–metal bonds ◆ Compliance and violation of the 18 electron rule ◆ Problems and exercises ◆ Supplementary reading ◆ **Chapter 3 Metal Carbonyls** ◆ Structure, π-bonding and infrared spectroscopy ◆ Bonding modes of CO ◆ Symmetry of metal carbonyls ◆ Syntheses of metal carbonyls ◆ Reactions of metal carbonyls ◆ Metal nitrosyls ◆ Problems and exercises ◆ Supplementary reading ◆ **Chapter 4 Neutral Spectator Ligands: Phosphines and N-heterocyclic Carbenes** ◆ Phosphines: steric and electronic parameters ◆ Basicity of phosphines ◆ Monodentate phosphines ◆ Multidentate phosphines ◆ N-Heterocyclic carbenes ◆ Problems and exercises ◆ Supplementary reading ◆ **Chapter 5 Alkenes and Alkynes as Ligands** ◆ Models of ethylene–metal bonding ◆ Synthesis of metal–alkene complexes ◆ Reactions of metal bound alkenes: The concept of Umpolung ◆ Alkynes: modes of bonding to metals ◆ Reactions of metal complexes of alkenes and alkynes ◆ Problems and exercises ◆ Supplementary reading ◆ **Chapter 6 Carbenes and Carbynes: Complexes with Metal–Carbon Double and Triple Bonds** ◆ Metal carbenes ◆ Metal carbynes ◆ Problems and exercises ◆ Supplementary reading ◆ **Chapter 7 Alkyl, Aryl and Ligands with Higher Hapticity** ◆ □ bonded alkyl groups as ligands ◆ Cyclic and acyclic polyenyl π bonded ligands ◆ Davies–Green–Mingos (DGM) rules ◆ Problems and exercises ◆ Supplementary reading ◆ **Chapter 8 Unique Reactions in Organometallic Chemistry** ◆ Oxidative addition and oxidative coupling ◆ Reductive elimination ◆ Migratory insertion reactions ◆ Problems and exercises ◆ Supplementary reading ◆ **Chapter 9 Ligand Substitution Reactions and Fluxionality in Organometallic Compounds** ◆ Types of ligand substitution reactions ◆ Associative substitutions ◆ Dissociative substitutions ◆ Interchange mechanisms ◆ Stereochemical non-rigidity in organometallic compounds ◆ Problems and exercises ◆ Supplementary reading ◆ **Chapter 10 Metal Clusters** ◆ Introduction ◆ Dinuclear clusters ◆ Multinuclear carbonyl clusters ◆ The isolobal analogy ◆ Synthesis of metal carbonyl clusters ◆ Reactions of metal carbonyl clusters ◆ Problems and exercises ◆ Supplementary reading ◆ **Chapter 11 Homogeneous Catalysis Using Organometallic Compounds** ◆ Catalysis ◆ Terminology in catalysis ◆ Sequences involved in a catalysed reaction ◆ Other important terminology used in catalysis ◆ Asymmetric synthesis using a catalyst ◆ Heterogeneous catalysis ◆ Feedstock for the chemical industry ◆ Problems and exercises ◆ Supplementary reading ◆ **Chapter 12 Catalytic Hydrogenation of Alkenes and Related Reactions** ◆ Hydrogenation catalysts ◆ Catalytic asymmetric synthesis ◆ Hydrocyanation of alkenes ◆ Hydrosilylation of alkenes ◆ Problems and exercises ◆ Supplementary reading ◆ **Chapter 13 Hydroformylation** ◆

Importance of hydroformylation ◆ Cobalt catalysts for hydroformylation ◆ Phosphine modified cobalt catalysts ◆ Rhodium–phosphine catalysts ◆ Factors affecting the n/iso ratio of hydroformylation products ◆ Enantioselective hydroformylation ◆ Carboalkoxylation of olefins ◆ Problems and exercises ◆ Supplementary reading ◆ **Chapter 14 Methanol Carbonylation and Olefin Oxidation: Monsanto, Cativa and Wacker** ◆ Processes ◆ History of methanol carbonylation ◆ The Monsanto process ◆ Celanese process using LiI modified rhodium catalyst ◆ Tennessee Eastman acetic anhydride process ◆ British Petroleum's Cativa process ◆ The Wacker process ◆ Problems and exercises ◆ Supplementary reading ◆ **Chapter 15 Olefin Metathesis** ◆ Olefin metathesis as a synthetic tool ◆ Well known olefin metathesis catalysts and their properties ◆ Synthesis of Grubbs' and Schrock catalysts ◆ Mechanism of olefin metathesis ◆ Comparison of catalysts ◆ Metathesis of hindered olefins ◆ Applications of catalytic olefin metathesis ◆ Alkyne metathesis ◆ Problems and exercises ◆ Supplementary reading ◆ **Chapter 16 Palladium Catalysed C–C and C–N Cross Coupling Reactions** ◆ Discovery of palladium based cross coupling reactions ◆ Industrial applications of cross coupling reactions ◆ The cross coupling catalyst ◆ The Heck reaction ◆ Suzuki–Miyaura coupling ◆ Sonogashira coupling ◆ Stille coupling ◆ Kumada coupling ◆ Negishi coupling ◆ Hiyama coupling ◆ Buchwald–Hartwig C–N cross coupling ◆ Cross coupling reactions in aqueous media with functional group tolerance ◆ Cross coupling reactions of organohalides with non-organometallic and non-heteroatom based reagents ◆ Problems and exercises ◆ Supplementary reading ◆ **Chapter 17 Olefin Polymerisation and Oligomerisation Reactions** ◆ Catalysts for olefin polymerisation ◆ Types of polyethylene and polypropylene ◆ The Ziegler–Natta catalyst ◆ Site control and chain end control mechanisms ◆ Metallocene based catalysts ◆ Post-metallocene catalysts ◆ Olefin oligomerisation reactions ◆ Problems and exercises ◆ Supplementary reading ◆ **Chapter 18 Ferrocene: Structure, Bonding and Reactions** ◆ Structure and bonding of ferrocene ◆ The reactions of ferrocene and its derivatives ◆ Ferrocene derivatives in asymmetric catalysis ◆ Problems and exercises ◆ Supplementary reading ◆ **Chapter 19 Organometallic Polymers** ◆ Polymers with organometallic moieties as pendant groups ◆ Polymers with organometallic moieties in the main chain ◆ Organometallic dendrimers ◆ Problems and exercises ◆ Supplementary reading ◆ **Chapter 20 Bioorganometallic Chemistry** ◆ Introduction ◆ Organometallic enzymes and coenzymes ◆ Role of organometallics in heavy metal poisoning ◆ Organometallic compounds as drugs ◆ Organometallics as radiopharmaceuticals, tracers, ionophores and sensors ◆ Problems and exercises ◆ Supplementary reading ◆ *Appendix 1:* Solutions to problems and exercises ◆ *Appendix 2:* Quick revision questions

2013	**536 pp.**	**Paperback**
978–81–7371–874–8		**₹ 1,075.00**

Chemical Process Calculations

K Asokan
Formerly Chief Scientist, Central Electro Chemical Research Institute (CECRI), Karaikudi, India

A range of materials like fuels, fertilizers, processed foods, life-saving pharmaceuticals and filtered clean water are being produced today. Several stages and processes are gone through during their production. Different materials or chemicals are added or removed in each step, and energy in the form of heat is also gained or lost. A chemical engineer needs to have a thorough understanding of how much of different materials is needed for the required output, as well as the energy balance of the processes involved. A course in chemical process calculations will help gain such an understanding.

The book provides a simple treatment of the subject matter. *The fundamental principles are explained through 173 worked examples. Exercise problems with answers (154 in number) are also given for practice.*

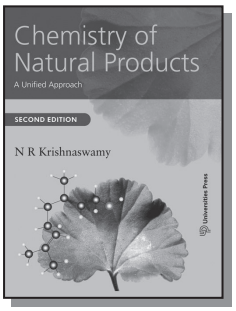
Contents: Dimensions, Units and Conversions ◆ Basic Concepts ◆ Material Balance in Non-Reaction Systems ◆ Material Balance in Reaction Systems ◆ Material Balance in Unit Operations ◆ Unsteady State Material Balance ◆ Energy Balance ◆ Fuels and Combustion ◆ *Answers to Problems*

Distributed worldwide by CRC Press LLC, USA, Taylor and Francis Group, except in India, Pakistan, Bangladesh, Sri Lanka, Nepal and Bhutan.

2007	**264 pp.**	**Paperback**
978–81–7371–594–5		**₹ 870.00**

Chemistry of Natural Products: A Unified Approach
(Second Edition)

N R Krishnaswamy
Former Professor, All India Institute of Medical Sciences, New Delhi, University of Delhi, Bangalore University, Calicut University and Sri Sathya Sai Institute of Higher Learning



This book provides a planned account of the common features structural and stereochemical of naturally occurring organic compounds). This is the only approach to bring about effective understanding of their chemistry. A variety of examples have been given to illustrate varied aspects so that the range of structure and behaviour exhibited by these compounds is retained within the set framework. The increasing application of physical (spectroscopic) methods like IR, NMR, CD, ORD, MS, High Resolution Mass Spectroscopy—using which, structural determinations are often done with very small or even microscopic quantities of the substance—is emphasised, without undermining the importance of 'classical' chemical methods. The section on problem solving helps to develop an analytical and critical evaluation of the data.

The Second Edition reflects the significant and important developments that have taken place since the publication of the first edition, particularly with regard to the biological aspects of natural products.

- Unified approach: Discusses all classes of compounds
- Unique approach: Discusses common structural and stereochemical features of naturally occurring organic compounds
- Page extent increased by 200 pages
- New chapter: Introduction
- Revised Introduction for all chapters
- Examples: About 100 examples across the book and 6 new per chapter
- Correlation with spectral data
- Problems: 5 additional problems

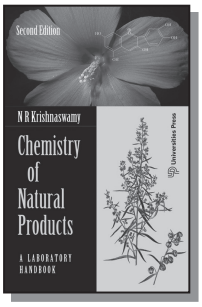
Contents: Introduction ◆ Structure ◆ Stereochemistry ◆ Reactions and Rearrangements ◆ Synthesis ◆ Biosynthesis ◆ Biological Significance of Secondary Metabolites ◆ *Problems* ◆ *Index*

Distributed worldwide by CRC Press LLC, USA, Taylor and Francis Group, except in India, Pakistan, Bangladesh, Sri Lanka, Nepal and Bhutan.

2010	432 pp.	Paperback
978–81–7371–677–5		₹ 1,075.00

Chemistry of Natural Products: A Laboratory Handbook

N R Krishnaswamy
Former Professor, All India Institute of Medical Sciences, New Delhi, University of Delhi, Bangalore University, Calicut University and Sri Sathya Sai Institute of Higher Learning



This book is a laboratory companion to the author's book, *Chemistry of Natural Products: A Unified Approach*, Second edition (Universities Press, 2010). ***The main objective is to provide students with experimental details for the successful isolation of different types of natural products.***

The handbook has been extensively revised and updated. Apart from including additional examples under isolation, chemical transformation and synthesis, two new chapters have been added to enlarge the scope of the book and make it useful to students of organic chemistry and biochemistry. They are:

- Metabolism of Natural Products
- Suggested Projects

Notes on how to collect and identify plant materials, and the preparation of diagnostic chemical reagents used in the characterisation of natural products, have been included.

The chemistry of natural products is a hybrid science combining the theory of organic chemistry with experimentation. This book contains a judicious combination of both spectroscopic and chemical methods. All the experiments have been successfully class tested.

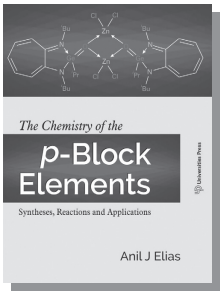
Contents: Introduction ⋄ A Survey of the Methods of Extraction, Isolation and Fractionation of Naturally Occurring Organic Compounds ⋄ Characterisation of Naturally Occurring Compounds ⋄ Procedures for Isolation of Select Compounds ⋄ Chemical Transformations of some Natural Products ⋄ Synthesis of Select Compounds ⋄ Metabolism of Natural Products ⋄ Suggested Projects ⋄ *Appendix A* ⋄ *Appendix B* ⋄ *Index of Compounds* ⋄ *Index of Plants* ⋄ *Index of Reagents*

Distributed worldwide by CRC Press LLC, USA, Taylor and Francis Group, except in India, Pakistan, Bangladesh, Sri Lanka, Nepal and Bhutan.

2012 **224 pp.** **Paperback**
978-81-7371-757-4 **₹ 545.00**

Chemistry of *p*-Block Elements: Syntheses, Reactions and Applications, The

Anil J Elias
Senior Professor (HAG), Department of Chemistry, Indian Institute of Technology Delhi, New Delhi



Online resources available

Chemistry of the *p*-block elements is an essential and integral component of the chemistry curriculum from the school level to the post-graduate level the world over. The main group elements differ significantly from the transition and inner transition elements. These elements and their compounds stand out from the rest because of their wide variety of proven applications including as fertilisers, crop protection agents, semiconductors, solar cells, pesticides, LEDs, explosives, catalysts, polymers, disinfectants and medicines. Each element of the *p*-block is unique with respect to its properties and applications which this book brings out emphatically and with clarity.

This book

- covers both fundamental chemistry and recent developments of the p-block elements from the undergraduate to post-graduate levels;
- contains three different levels of solved problems and exercises—multiple choice, concept-based questions and advanced level exercises with solutions that will help students to master the subject by self-study;
- provides selected historical and interesting developments in boxes which gives the reader a fascinating perspective of the development of a field;
- presents recent path-breaking research developments under each element with schematic representations and references updated till 2018 for the research community;
- is lavishly complemented with figures, equations and schemes for easy comprehension;
- will be an extremely useful and authentic source book and reference book for students preparing for competitive examinations such as JEE, NEET, JAM, GATE, CSIR, GRE and SAT.

Online resources available at:
www.universitiespress.com/pblockelements

Contents: Introduction ⋄ Structure and bonding of p-block compounds: unique aspects ⋄ The chemistry of boron ⋄ The Chemistry of aluminium, gallium, indium and thallium ⋄ The chemistry of carbon ⋄ The chemistry of silicon ⋄ The chemistry of germanium, tin and lead ⋄ The chemistry of nitrogen ⋄ The chemistry of phosphorus ⋄ The chemistry of arsenic, antimony and bismuth ⋄ The chemistry of oxygen and sulfur ⋄ The chemistry of

selenium and tellurium ◆ The chemistry of fluorine ◆ The chemistry of chlorine, bromine and iodine ◆ The chemistry of noble gases

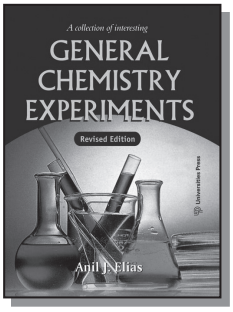
"I recommend this book for the undergraduates as well as for the graduate students. The text is well written and easily understandable. Moreover, at the end of each chapter are questions for self- study, which are very useful for every reader."

Prof. Dr Herbert W Roesky,
Georg-August-Universität, Göttingen, Germany

2019	648 pp.	Paperback
978-93-86235-71-8		₹ 1,425.00

Collection of Interesting General Chemistry Experiments, A

A J Elias
Professor, Department of Chemistry, IIT Delhi, New Delhi



This novel collection of twenty-two experiments, covering all areas of practical chemistry, has been introduced for the basic chemistry courses of Indian Institute of Technologies (IITs) and similar courses at other institutions where chemistry is taught at the undergraduate level. The experiments are modern and interesting and can be carried out with the existing facilities in any chemistry undergraduate laboratory. The emphasis is on experiments, which involve chemicals and products encountered in the day-to-day life of an average student. Each experiment also includes a write up on the theoretical background required to understand the chemistry behind the experiment and to enjoy the experience of doing it in the laboratory.

The new experiments included in this revised edition cover the area of electrochemistry, an important component of undergraduate practical chemistry. This book would be useful to all undergraduate chemistry courses especially the IITs.

2008	160 pp.	Paperback
978-81-7371-599-0		₹ 550.00

College Practical Chemistry

V K Ahluwalia
Visiting Professor at the Dr B R Ambedkar Centre for Biomedical Research, University of Delhi

Sunita Dhingra
Reader, Miranda House, University of Delhi

Adarsh Gulati
Reader, Miranda House, University of Delhi

- This book contains a complete treatment of practical chemistry which would meet the requirement of undergraduate students of chemistry at different universities in India.
- Presents the basic theory and procedure for each experiment.
- Divided into three sections – Inorganic Chemistry, Organic Chemistry and Physical Chemistry.

Contents: *Preface* ◆ Part I: INORGANIC CHEMISTRY: Qualitative Inorganic Analysis ◆ Volumetric Analysis ◆ Gravimetric Analysis ◆ Preparation of Inorganic Compounds ◆ Part II: ORGANIC CHEMISTRY: Qualitative Organic Analysis (Systematic Identification of Organic Compounds) ◆ Preparation and Isolation of Organic Compounds ◆ Chromatography ◆ Part III: PHYSICAL CHEMISTRY: Physical Methods for Determining Molar Masses ◆ Measurement of Viscosities and Surface Tensions of Liquids ◆ Measurement of Solubilities ◆ Determination of Transition Temperatures ◆ Determination of Order of a Reaction ◆ Adsorption Studies ◆ Polyphase Heterogeneous Equilibria ◆ Thermochemical Measurements ◆ Conductance Measurements in Electrolytes ◆ Potentiometric Measurements in Chemical Systems ◆ Polarography ◆ Polarimetry and Photometry ◆ *Appendices* ◆ *Index*

2005	524 pp.	Paperback
978-81-7371-506-8		₹ 875.00

Comprehensive Practical Organic Chemistry: Qualitative Analysis

V K Ahluwalia & Sunita Dhingra

This manual for practical qualitative analysis covers the use of spectroscopic methods for identification of various functional groups. Comprehensive tables giving methods for the systematic identification of pure specimens, separation of mixtures and compounds, and procedures for preparation of derivatives are some of the salient features of the book.

Contents: *Preface* ◆ Safety in the Laboratory ◆ Introduction ◆ Preliminary Examination ◆ Detection of Functional Groups ◆ Preparation and Recrystallisation of Derivatives ◆ Application of Spectroscopy to the Identification of Organic Compounds ◆ Separation of Mixtures ◆ Tables of Organic compounds ◆ Preparation of Reagent and Indicators ◆ Summary of the Scheme Used for Identification of Unknown Organic Compounds ◆ Suggested Books for Further Reading ◆ *Index*

2000	**304 pp.**	**Paperback**
978–81–7371–428–3		**₹ 850.00**

Comprehensive Practical Organic Chemistry: Quantitative Analysis

V K Ahluwalia & Renu Aggarwal

In this book on quantitative analysis and reagent preparation, the authors adopt a novel approach—all the preparations have been given in the form of organic reactions in alphabetical order, with their respective reaction mechanisms. The procedures of some preparations are also discussed. Estimation of various compounds and functional groups is also included. A complete chapter is devoted to chromatography, with exercises.

2004	**332 pp.**	**Paperback**
978–81–7371–475–7		**₹ 800.00**

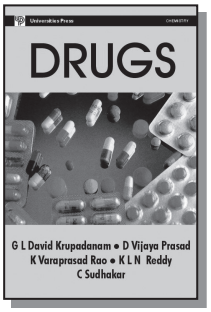
Drugs

PRINT ON DEMAND

G L David Krupadanam
Professor of Organic Chemistry, Department of Chemistry, Osmania University, Hyderabad

D Vijaya Prasad
Reader and Head, Department of Chemistry, New Government Degree College, Khairatabad, Hyderabad

K Varaprasad Rao
Reader in Chemistry, New Science College, Ameerpet, Hyderabad



K L N Reddy
Lecturer, New Government Degree college, Khairatabad, Hyderabad

C Sudhakar
Lecturer, New Government Degree College, Khairatabad, Hyderabad

Drugs have played a central role in the progress of human civilization. There are many important stages before a compound is used as a drug to treat a disease. This book deals with the historical aspects of the development and use of drugs, vitamins, hormones; their classification, synthesis and formulation; and the general principles of drug actions. The pharmacokinetics, the interaction of drugs in the targeted receptor, and mode of drug synthesis is explained in detail.

Contents: **1. Introduction** ◆ The requirements of an ideal drug ◆ Sources of drugs ◆ Historical evolution of drugs ◆ Terminology and description of the terms ◆ Pharmacokinetics ◆ Pharmacodynamics ◆ Metabolites and ant metabolites ◆ Pharmacophore ◆ Bacteria ◆ Fungi ◆ Viruses ◆ Mutations ◆ **2. Pharmacodynamic agents** ◆ Classification of drugs-criteria ◆ Structure – activity relationship (SAR) in drugs ◆ Drugs acting on the central nervous system (CNS) ◆ Drugs acting on the peripheral nervous system (PNS) ◆ Drugs acting on the cardiovascular system ◆ Drugs acting on the hematopoietic system ◆ Drugs acting on the renal system ◆ **3. Vitamins, hormones and synthetic drugs** ◆ Hormones: the chemical messengers ◆ Synthetic and natural drugs ◆ Synthetic drugs ◆ Natural drugs ◆ **4. Formulation of**

drugs ◆ Solid dosage forms ◆ Liquid dosage forms ◆ Semi – solid dosage forms ◆ *Glossary* ◆ *Index*

2001	**168 pp.**	**Paperback**
978–81–7371–386–6		**₹ 475.00**

Electronic Absorption Spectroscopy

D N Sathyanarayana

This book provides a conceptual and experimental basis for the interpretation of electronic absorption spectroscopy and related techniques. The basic theories, instrumentation and interpretation of the spectra of organic and coordination compounds for structural studies are presented step-by-step, in an easily understandable style. Related topics of emission spectroscopies are covered as well.

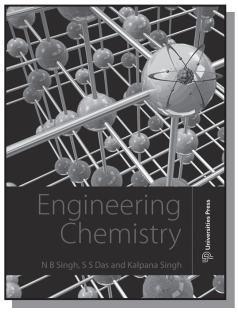
2001	**544 pp.**	**Paperback**
978–81–7371–371–2		**₹ 995.00**

Engineering Chemistry

N B Singh
Former Professor and Head, Department of Chemistry, DDU Gorakhpur University and Academic Coordinator for the Ph D programme, Sharda University

S S Das
Professor, Department of Chemistry, DDU, Gorakhpur University

Kalpana Singh
Associate Professor, GNIT, Greater Noida



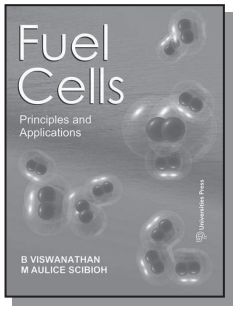
- ***Engineering Chemistry*** has been tailored precisely to suit the needs of technical universities in Uttar Pradesh and meets the requirements of the B Tech students.
- The book is written in simple language which makes understanding easy.
- The authors have presented the subject matter in a very lucid and comprehensive manner.
- Several solved examples are included. SI units have been consistently used.
- Relevant figures, tables, labelled diagrams and equations are presented wherever required.
- Exhaustive exercises in the form of questions and problems have been provided to test the comprehension of students.

2012	**276 pp.**	**Paperback**
978–81–7371–810–6		**₹ 475.00**

Fuel Cells: Principles and Applications

B Viswanathan
Professor, Department of Chemistry, Indian Institute of Technology, Madras

M Aulice Scibioh
Visiting Research Scientist, Fuel Cell Research Center, Korea Institute of Science and Technology, Seoul



This book discusses the scientific principles and technology of various types of fuel cells—PEM (polymer membrane fuel cell), PAFC (phosphoric acid fuel cell), MCFC (molten carbonate fuel cell), SOFC (solid oxide fuel cell) and DMFC (direct methanol fuel cells). Fuel cells are power-generating devices with a wide range of applications including stationary power generation (MW), portable power generation (kW) and transportation (kW). The key advantages of the fuel cell are high efficiency, the lack of emissions, modularity, fuel flexibility, and high power density. The only emission from fuel cells is water when hydrogen is fed to the fuel cell. For these reasons, research in the area of fuel cells is of great significance. The book provides a snapshot of the present status of this rapidly progressing field: the ongoing breakthroughs in research and development, the directions for the future, and the proactive work of

several firms in commercially producing fuel cell systems The book is a comprehensive reference book, explaining concepts and their applications. The interdisciplinary approach that draws on and clarifies the most recent research trends, makes this book interesting to everyone who is concerned with energy demands and fuel cells.

Contents: Introduction ◆ Electrochemistry Basis ◆ Alkaline Fuel Cells ◆ Phosphoric Acid Fuel Cells ◆ Solid Oxide Fuel Cells ◆ Molten Carbonate Fuel Cells ◆ Direct Methanol Fuel Cells ◆ Proton Exchange Membrane Fuel Cells ◆ Fuel Processing ◆ Hydrogen Storage ◆ Energy, Environment and Development: Future Prospects ◆ *Index*

Distributed worldwide by CRC Press LLC, USA, Taylor and Francis Group, except in India, Pakistan, Bangladesh, Sri Lanka, Nepal and Bhutan.

2006	**504 pp.**	**Paperback**
978–81–7371–557–0		**₹ 1,095.00**

Functional Materials: A Chemists Perspective

Vijayamohanan K Pillai
Acting Director, Central Electrochemical Research Institute, Karaikudi, Tamil Nadu
Scientist, Physical & Materials Chemistry Division, National Chemical Laboratory, Pune

Meera Parthasarathy
Assistant Professor in the Department of Chemistry, School of Chemical & Biotechnology, SASTRA University, Thanjavur, Tamilnadu

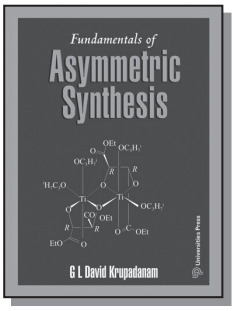
This book introduces the reader to the basic concepts, lines of development, main characteristics and applications of functional materials. Several examples of functional materials developed during the last two decades are used to illustrate their versatility and range of function. This book examines the preparation and characterization of some of these materials from the perspective of a synthetic chemist. Although research in this area is multidisciplinary, the chemistry of these materials is given special importance. Existing and emerging applications of functional materials in energy storage, polymer electronics, chemical sensors, nanobiotechnology and medicine are highlighted.

Contents: *Foreword* ◆ *Preface* ◆ *Acknowledgements* ◆ *About the Series* ◆ *Editorial Advisory Board* ◆ **1 Functional Materials: A Virtual Tour** ◆ Materials Science and Engineering—The Conventional Outlook ◆ What are Functional Materials? ◆ Where do Functional Materials come from? ◆ Historical Perspectives ◆ Lessons from Nature ◆ Significance of Functional Materials ◆ Engineering Functions ◆ Dematerialization ◆ The Way Ahead—Multiscale Modelling and Computation ◆ Conclusions **2 Classification of Functional Materials** ◆ Introduction ◆ Classification Based on Chemical Identity ◆ Classification Based on Functions and Applications ◆ Technological Relevance ◆ Conclusions **3 Molecular Self-Assembly** ◆ Introduction ◆ Classification of Self-assembled Monolayers ◆ Synthetic Protocols and Challenges ◆ Limitations of Self-assembly ◆ Applications of SAMs ◆ Conclusions **4 Bioinspired Materials** ◆ Introduction ◆ Classification of Bioid Materials ◆ Bionics: Bioinspired Information Technology ◆ Biomineralization—en route to Nanotechnology ◆ Advantages and Limitations ◆ Challenges Ahead ◆ Conclusions **5 Smart Materials** ◆ Introduction ◆ Smart Tools to Impart intelligence ◆ Representative Examples ◆ Technological Limitations and Challenges ◆ Conclusions **6 Functional Materials for Sustainable Energy** ◆ Introduction ◆ Materials for Solar Energy Conversion ◆ Materials for Electrochemical Power Sources ◆ Hydrogen Economy—a Material Challenge ◆ Impact of Nanotechnology ◆ Conclusions **7 Materials for Polymer Electronics** ◆ Introduction ◆ From Molecular Electronics to Polymer Electronics ◆ Polymeric Semiconductors in Light Emitting Diodes ◆ Polymer Photovoltaics ◆ Polymer Displays ◆ Field Effect Transistors ◆ Intelligent Polymers for Data Storage ◆ Conclusions **8 Functional Nanocomposites** ◆ Why 'Nano'composites? ◆ Classification of Nanocomposites ◆ Synthetic Strategies ◆ How to make Nanocomposites 'Functional'? ◆ Interfacial Engineering—Harvesting Maximum Performance ◆ Theoretical models for Interfacial Interactions ◆ Applications of Nanocomposites ◆ Conclusions ◆ **Going Beyond Functional Materials—Future Directions** ◆ Introduction ◆ Limitations of Functional Materials ◆ Major Challenges in Developing Next Generation Materials ◆ Social Impact of Functional Materials ◆ Functional Materials and the UN Millennium Development Goals ◆ Predictions for the Future ◆ *Epilogue* ◆ *Index*

2012	**408 pp.**	**Paperback**
978–81–7371–768–0		**₹ 1,110.00**

Fundamentals of Asymmetric Synthesis

G L David Krupadanam
Advisor, Research & Development, Osmania University



The book deals with the fundamental concepts, terminology, mechanistic aspects and applications of asymmetric synthesis. Asymmetric reactions are used by synthetic organic chemists in developing shorter routes for the synthesis of complex natural molecules as well as a wide range of drug intermediates. It will be useful to teachers and students at the postgraduate level, open education learners, research scholars and researchers in all universities, institutions and industries.

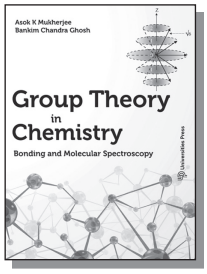
Contents: Introduction ◆ Terms, definitions and concepts in asymmetric synthesis ◆ Achiral and chiral molecules and their properties ◆ Prochirality ◆ Enantioselective and diastereoselective synthesis ◆ Methods for monitoring enantioselective and diastereoselective synthesis ◆ Methods for inducing asymmetry ◆ Chiral substrate controlled asymmetric reactions: Diastereoselection in acyclic systems ◆ Chiral auxiliary controlled asymmetric reactions—asymmetric □-alkylations ◆ Chiral stoichiometric reagent controlled asymmetric synthesis: Chiral boron reagents ◆ Chiral catalyst mediated asymmetric reactions: Enzymes ◆ Chiral organometallic catalysed asymmetric reactions: Sharpless asymmetric epoxidations, dihydroxylations and aminohydroxylations ◆ Chiral organometallic catalysed asymmetric reactions ◆ Organocatalysts in asymmetric synthesis—chiral additive mediated reactions ◆ Asymmetric aldol reaction ◆ Asymmetric Diels–Alder reactions ◆ Stereoselective synthesis and stereospecific synthesis ◆ *Annexure 1:* Symmetry elements and symmetry operations ◆ *Annexure 2:* Point groups ◆ *Annexure 3:* Molecules with one chiral centre ◆ *Annexure 4:* Molecules with two or more chiral centres

2013	468 pp	Paperback
978–81–7371–892–2		₹ 1,170.00

Group Theory in Chemistry: Bonding and Molecular Spectroscopy

Asok K Mukherjee
Professor of Chemistry, Retd, University of Burdwan

Bankim Chandra Ghosh
Assistant Professor of Chemistry, Durgapur Government College



Online resources available

Group theory is included in the M Sc chemistry curriculum of almost all universities. In fact, proper understanding of chemical bonding and molecular spectroscopy remains incomplete without at least a preliminary knowledge of molecular symmetry aspects which are best dealt with by the representation theory of groups. A good student with basic knowledge in elementary quantum chemistry and mathematics will be able to follow the book.

Salient features: All discussions start with familiar examples and then proceed to explain the abstract concepts of Group Theory. ◆ The author's approach removes the fear of abstract concepts while maintaining the correctness of the necessary mathematical statements and proofs. ◆ Gives the student sufficient working knowledge for applying group theory to any structural/spectroscopic problem. ◆ Students can construct simple cardboard models of the Platonic solids to help them to understand the intricate symmetry operations which are essential for exposition of molecular structure and chemical bonding. ◆ Drawing stereographic projections of the point groups and construction of symmetry multiplication tables of large groups and character tables of direct product groups have been

explained in detail. ◆ Each chapter contains review questions, short/MCQs, and practice problems.

Online resources available at:
www.universitiespress.com/akm_bcg/gtc

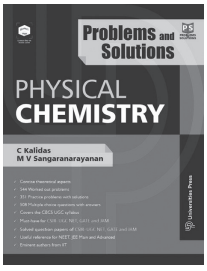
Contents: *Preface* ◆ Elements of symmetry, symmetry operations and point groups ◆ Symmetry of the Platonic solids ◆ Vector space and matrices ◆ Representation of symmetry operators and point groups by matrices ◆ The great orthogonality theorem and its consequences ◆ Direct product groups and enumeration of crystallographic point groups ◆ Link between group theory and quantum mechanics ◆ Chemical bonding I: molecular orbital theory ◆ Chemical bonding II: localised molecular orbitals ◆ Chemical bonding III: Hückel method of p-mo calculation ◆ Molecular vibrations: infrared and Raman spectroscopy ◆ Spin–orbit coupling: term symbols ◆ Crystal field theory and bonding in metal complexes ◆ Orbital symmetry in pericyclic reactions ◆ *Appendix 1:* Proof of the great orthogonality theorem ◆ *Appendix 2:* Regular representation of point groups and the celebrated theorem ◆ *Appendix 3:* Character tables of some important point groups ◆ *Appendix 4:* Correlation tables for Oh and Td groups ◆ *Index*

2018	**528 pp.**	**Paperback**
978–93–86235–19–0		**₹ 1,095.00**

Physical Chemistry: Problems and Solutions

C Kalidas
Professor and HOD (Retd.), Department of Chemistry
Indian Institute of Technology Madras, India

M V Sangaranarayanan
Professor, Department of Chemistry, Indian Institute of Technology Madras, India



Online resources available

This book presents an extensive collection of diverse types of worked out examples, practice problems and multiple choice questions. The aim is to gain adequate expertise in solving a variety of numerical, conceptual and descriptive questions. The level of questions ranges from the fundamental to the advanced, with the hope that the book will be found useful by a wide spectrum of students at all levels. The book is primarily intended as a companion to textbooks in physical chemistry.

This much-awaited book, covers all the main topics of physical chemistry at the undergraduate and post-graduate levels, includes essential theoretical aspects required for problem solving, provides 544 worked out problems, 351 practice problems with solutions, 508 multiple choice questions with solutions, is written as per the CBCS UGC syllabus by eminent authors from IIT, aids preparation for competitive examinations such as CSIR–UGC NET, GATE and JAM, includes solved question papers of CSIR–UGC NET, GATE and JAM, provides access to an App for revision on your Android mobile phone.

Online resources available at:
www.universitiespress.com/
PhysicalChemistryProblemsAndSolutions

Contents: *Preface* ◆ *Fundamental Constants* ◆ Gaseous State ◆ Thermodynamics ◆ Electrochemistry ◆ Chemical Kinetics ◆ Liquid State ◆ Surface Chemistry, Catalysis and Colloids ◆ Solid State ◆ Photochemistry ◆ Solutions ◆ Phase Rule and Phase Equilibrium ◆ Polymer Chemistry ◆ Quantum Chemistry ◆ Acid–Base and Other Ionic Equilibria, Buffers and Buffer Action, Indicators ◆ Nuclear Chemistry ◆ Applications of Statistical Thermodynamics ◆ Miscellaneous Problems ◆ *Bibliography* ◆ *Appendix 1:* CSIR–UGC NET JRF/SET Solved Question Paper ◆ *Appendix 2:* GATE Solved Question Paper ◆ *Appendix 3:* JAM Solved Question Paper ◆ *Index*

2019	**424 pp.**	**Paperback**
978–93–89211–18–4		**₹ 850.00**

Principles of Metallurgical Thermodynamics

Subir Kumar Bose (Late)
Professor, Indian Institute of Technology Kharagpur

Sanat Kumar Roy
Professor, Indian Institute of Technology Kharagpur

The book deals with the thermodynamics of reactive systems, with emphasis on the reactivity of metals and materials being used by metallurgical and materials scientists all over the world. Though the focus is on equilibrium thermodynamics, it also touches upon some methods to incorporate non-equilibrium effects relevant to material scientists. This knowledge will enable students to solve the challenging problems faced during operation in different materials-processing routes. It will also help in the search for new substances that might revolutionize high as well as low temperature applications because of their super-fluid and super-conducting properties, outer space environmental adaptability and more attractive electrical, magnetic and dielectric properties.

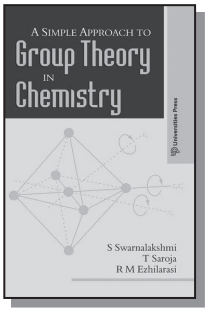
2014	688 pp.	Paperback
978–81–7371–927–1		₹ 1,350.00

Simple Approach to Group Theory in Chemistry, A

S Swarnalakshmi
Former Reader, Department of Chemistry, Guru Nanak College, Chennai

T Saroja
Selection Grade Lecturer, Department of Chemistry, Guru Nanak College, Chennai

R M Ezhilarasi
Senior Scale Lecturer, Department of Chemistry, Guru Nanak College, Chennai

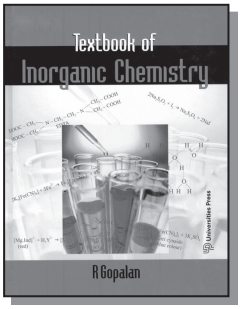


This book has been specially designed to use a simple and easily understandable approach that explains the basics of symmetry elements and operations, how to identify point groups and the application of group theory in spectroscopy. The numerous worked-out examples and illustrations of symmetry elements and operations guide the reader in a step-wise manner through the subject. ***Even those without a background in mathematics will find this approach easy and helpful.***

2008	156 pp.	Paperback
978–81–7371–623–2		₹ 550.00

Textbook of Inorganic Chemistry

R Gopalan
Formerly Head, Department of Chemistry, Madras Christian College, Chennai; Director, Sri Malolan College of Arts and Science, Maduranthagam, India



Textbook of Inorganic Chemistry conforms to the syllabus of the B. Sc Chemistry courses of Indian universities. This book not only fulfils the requirements of the syllabus but also caters to the students who would like to delve deeper into the subject. It convinces the student that there is more to inorganic chemistry than equations! This book will serve as a handy tool for teachers to plan their lectures.

Special Features: Objectives are listed to give an overview of the chapter ◆ Involves a systematic and interesting approach ◆ Several worked out problems are provided ◆ 'Boxed' matter on popular aspects are presented ◆ Exhaustive question bank is provided at the end of each chapter

Contents: *Preface* ◆ **Chapter 1: Atomic structure:** Orbitals, electrons and quantum numbers ◆ Pauli's exclusion principle, Hund's rule of maximum multiplicity ◆ The Aufbau principle ◆ Electron configuration, orbital stability and reactivity ◆ Shapes of atomic orbitals ◆ Exercises ◆ **Chapter 2: Periodicity of properties:** Periodic table: a review ◆ Electronic basis for the periodic classification ◆ Periodicity ◆ Lanthanide contraction ◆ Inert pair effect ◆ Diagonal relationship ◆ Exercises ◆ **Chapter 3: Principles of inorganic qualitative analysis:** Objectives ◆ Introduction (some fundamental concepts) ◆ Acid–base equilibria ◆ Solubility product ◆ Application of common ion effect in qualitative analysis ◆ Types of reactions in inorganic qualitative analysis ◆ Semimicro analysis ◆ Exercises ◆ **Chapter 4: Principles of volumetric analysis:** Introduction ◆ Concentration units ◆ Calculation of equivalent weights ◆ Theories of titrations ◆ Exercises ◆ **Chapter 5: Solvents for inorganic reactions:** Introduction ◆ Protic solvents ◆ Aprotic solvents ◆ Aqueous solvents ◆ Nonaqueous solvents ◆ Liquid ammonia ◆ Solutions of metals in liquid ammonia ◆ Acetic acid ◆ Exercises ◆ **Chapter 6: Ionic bond:** Introduction ◆ Lewis dot symbols ◆ Types of bonds ◆ General properties of ionic compounds ◆ Structures of ionic crystals ◆ Hydration energy ◆ Lattice energy ◆ The Born–Haber cycle ◆ Trends in lattice energies ◆ Applications of lattice energetics ◆ Transitions between electrovalence and covalence ◆ Exercises ◆ **Chapter 7: Covalent bond: VB theory:** Introduction ◆ Theories of bonding ◆ Valence bond theory: formation and properties of covalent bonds ◆ Types of orbital overlap ◆ Hybridisation of orbitals ◆ Bond pairs and lone pairs ◆ Valence shell electron pair repulsion theory (VSEPR Theory) ◆ Partial ionic character of covalent bonds ◆ Directional bonding ◆ Resonance in inorganic molecules ◆ Polar interactions ◆ Exercises ◆ **Chapter 8: Covalent bond: Molecular orbital theory:** Introduction: molecular orbitals ◆ Molecular orbital treatment ◆ Comparison between the VB and the MO theories ◆ Hydrogen bonding ◆ Exercises ◆ **Chapter 9: Hydrogen:** Introduction ◆ Preparation of hydrogen ◆ Physical properties ◆ Reactions of hydrogen ◆ Hydrogen as a fuel ◆ Isotopes of hydrogen ◆ Hydrides: introduction ◆ Classification of the hydrides ◆ Exercises ◆ **Chapter 10: Alkali metals:** Introduction: comparative study of the elements ◆ Occurrence ◆ Metallurgy of alkali elements ◆ Uses of alkali metals ◆ Some compounds of alkali metals ◆ Lithium: anomalous properties ◆ Potpourri ◆ Exercises ◆ **Chapter 11: Alkaline earth metals:** Introduction ◆ Comparative study of the elements ◆ Diagonal relationship ◆ Uses ◆ Some compounds of group 2 elements ◆ Exceptional properties of beryllium ◆ Isolation of group 2 elements ◆ Potpourri ◆ Exercises ◆ **Chapter 12: Boron family:** Comparative account of elements of group 13 ◆ Chemistry of Boron ◆ Boron hydrides (boranes) ◆ Other boron compounds ◆ Chemistry of aluminium ◆ Gallium, indium and thallium ◆ Potpourri ◆ Exercises ◆ **Chapter 13: Carbon Family:** Introduction ◆ Some compounds of carbon and silicon ◆ Carbides ◆ Silicates ◆ Silicones ◆ Germanium ◆ Tin ◆ Lead ◆ Potpourri ◆ Exercises ◆ **Chapter 14: Nitrogen family:** Introduction ◆ Chemistry of nitrogen ◆ Chemistry of phosphorus ◆ Chemistry of arsenic ◆ Chemistry of antimony ◆ Chemistry of bismuth ◆ Exercises ◆ **Chapter 15: Oxygen family:** Comparative account ◆ Chemistry of oxygen ◆ Chemistry of sulphur ◆ Chemistry of selenium, tellurium and polonium

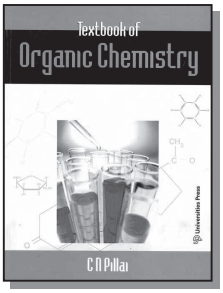
◆ Potpourri ◆ Exercises ◆ **Chapter 16: Halogens:** Introduction ◆ Comparative account of the halogens ◆ Chemistry of fluorine ◆ Chemistry of chlorine ◆ Chemistry of bromine ◆ Chemistry of iodine ◆ Chemistry of astatine ◆ Exercises ◆ **Chapter 17: Noble Gases:** Introduction ◆ Chemistry of noble gases ◆ Chemistry of xenon ◆ Potpourri ◆ Exercises ◆ **Chapter 18: Principles of Metallurgy:** Introduction ◆ Occurrence of metals ◆ Metallurgy ◆ Metals from the sea ◆ Microbial metallurgy ◆ Potpourri ◆ Exercises ◆ **Chapter 19: Transition elements: Introduction:** Introduction ◆ Abundance ◆ Atomic and ionic radii ◆ Magnetic properties ◆ Chemical properties ◆ Differences between the first row and the other two rows ◆ Comparison of transition and representative elements ◆ Exercises ◆ **Chapter 20: Chemistry of transition elements:** Titanium group: comparative study ◆ Vanadium group: comparative study ◆ Chromium group: comparative study ◆ Manganese, technicium, rhenium: comparative study ◆ Iron, cobalt and nickel: comparative study ◆ The platinum metals: comparative study ◆ Copper, silver and gold: comparative study ◆ Zinc, cadmium and mercury: comparative study ◆ Exercises ◆ **Chapter 21: Inner transition elements:** Introduction ◆ Chemistry of lanthanides ◆ Chemistry of actinides ◆ Chemistry of thorium ◆ Chemistry of uranium ◆ Uses of actinides ◆ Potpourri ◆ Exercises ◆ **Chapter 22: Coordination compounds:** Introduction ◆ Nomenclature of metal complexes ◆ Theories of coordination compounds ◆ Spectral characteristics of metal complexes ◆ Magnetic properties of metal complexes ◆ Chelates ◆ Isomerism of metal complexes ◆ Identification of isomeric metal complexes ◆ Applications of coordination compounds ◆ Potpourri ◆ Exercises ◆ **Chapter 23: Bioinorganic chemistry:** Objectives ◆ Introduction ◆ Transport and storage of oxygen ◆ Electron transfer ◆ Catalysis ◆ Photosynthesis ◆ Vitamin B_{12} (cyanocobalamin) ◆ Inventory of iron in the human body ◆ Metal complexes in the human system ◆ Metal complexes in therapy ◆ The significance of chelation in soil biology ◆ Exercises ◆ **Chapter 24: Nuclear chemistry:** Introduction ◆ Properties of radioactive rays ◆ Laws of radioactive decay ◆ The fundamental particles ◆ The atomic nucleus ◆ Isotopes ◆ Detection and measurement of radiation ◆ Nuclear transmutations ◆ Applications of nuclear science ◆ Exercises ◆ **Chapter 25: Industrial inorganic chemistry:** Surface coatings ◆ Cement ◆ Fuels ◆ Relative merits of fuels ◆ Glass ◆ Exercises ◆ **Chapter 26: Environmental Chemistry:** ◆ Introduction ◆ Air pollution ◆ Water pollution ◆ Radionuclides in water ◆ Soil pollution ◆ Pollution by heavy metals ◆ Noise pollution ◆ Rain water harvesting ◆ Exercises ◆ Supplementary Reading ◆ *Index* ◆ *Periodic Table*

Distributed worldwide by CRC Press LLC, USA, Taylor and Francis Group, except in India, Pakistan, Bangladesh, Sri Lanka, Nepal and Bhutan.

2009	**960 pp.**	**Paperback**
978–81–7371–752–9		**₹ 1,095.00**

Textbook of Organic Chemistry

C N Pillai
Formerly Professor, Department of Chemistry, Indian Institute of Technology Madras, Chennai, India



Textbook of Organic Chemistry is meant for students who learn organic chemistry at the undergraduate level and who have already had exposure to the basics of chemistry, including an introduction to organic chemistry. This book conforms to the syllabus of Indian Universities at the undergraduate level, but can be useful to students at a more advanced level also.

The book has a deductive approach and reduces the need to learn by rote. Each chapter has been structured in a logical and interesting manner that facilitates easy reading and understanding. This approach has been developed and perfected by the author over the course of his tenure as a teacher of organic chemistry. At the end of each chapter, exercises are provided which strengthen the students' understanding of the concepts discussed in the text. 'Challenging Questions' are given for those students who want to delve deeper into the subject. Topics of current interest that are related to the subject matter of the chapter are suggested for preparing project reports.

This book represents the hope that students of Indian universities who use it will appreciate

that much of organic chemistry can be logically deduced from fundamentals and is amenable to reasonable explanations and deductions.

Special features: Objectives are listed to give an overview of the chapter ◆ Involves a deductive approach ◆ Chapters are developed in a logical and interesting manner ◆ Extensive exercises are provided at the end of each chapter

Contents: Basic concepts of bonding in organic chemistry ◆ Nomenclature of organic compounds ◆ Alkanes ◆ Alkenes ◆ Alkynes ◆ Dienes ◆ Polymerisation ◆ Cycloalkanes ◆ Aromatic hydrocarbons and aromaticity ◆ Polynuclear aromatic hydrocarbons ◆ Aliphatic nucleophilic substitution reactions ◆ Elimination reactions ◆ Determination of structure using spectroscopy ◆ Alcohols ◆ Phenols ◆ Carbonyl chemistry ◆ Carboxylic acids ◆ Nitrogen containing compounds ◆ Molecular rearrangements ◆ Heterocyclic compounds ◆ Stereochemistry – I ◆ Stereochemistry – II ◆ Bioorganic chemistry – carbohydrates and vitamins (Natural products-I) ◆ Bioorganic chemistry – Aminoacids, proteins and nucleic acids (Natural Products-II) ◆ Terpenoids and alkaloids (Natural Products-III) ◆ Dyes ◆ Supplementary reading ◆ *Index*

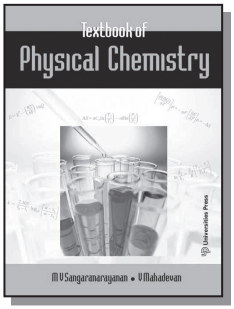
Distributed worldwide by CRC Press LLC, USA, Taylor and Francis Group, except in India, Pakistan, Bangladesh, Sri Lanka, Nepal and Bhutan.

2010	**640 pp.**	**Paperback**
978–81–7371–689–8		**₹ 1,045.00**

Textbook of Physical Chemistry

M V Sangaranarayanan
Professor, Department of Chemistry, Indian Institute of Technology Madras, Chennai, India

V Mahadevan
Formerly Professor, Department of Chemistry, Indian Institute of Technology Madras, Chennai, India



Textbook of Physical Chemistry, together with the companion books on organic chemistry and inorganic chemistry, meets the complete requirements of undergraduate students of chemistry across India. In a book comprising all the classical topics which span physical chemistry including chemical kinetics, electrochemistry and thermodynamics among others, uniformity in the depth of coverage of each topic is not easy to attain in view of the disjointed pace of growth of each discipline. Nevertheless, care has been taken to ensure that the material in this book will sustain the interest of students and motivate them to learn physical chemistry. In order to aid students, every chapter contains the Objectives at the beginning and Key Points at the end. Various aspects of physical chemistry are dealt with in a lucid manner and interesting related matter is highlighted in boxes. The derivations are given in a comprehensible manner. Since physical chemistry involves numericals, several worked examples complement the text. The exercises at the end of each chapter, in particular, will be extremely valuable to sharpen the problem-solving skills and direct the student towards appreciating the nuances of physical chemistry.

Special Features: Objectives are listed to give an overview of the chapter ◆ Derivations are kept simple ◆ Interesting matter is highlighted in grey boxes ◆ Numerous worked out examples complement the text ◆ Exercises at the end of each chapter to sharpen the problem-solving skills

Contents: Quantum Chemistry ◆ Gaseous State ◆ Liquid State ◆ Solid State ◆ Colloidal State ◆ First Law of Thermodynamics ◆ Second Law of Thermodynamics ◆ Third Law of Thermodynamics ◆ Solutions ◆ Phase Equilibria ◆ Chemical Kinetics ◆ Surface Chemistry and Catalysis ◆ Photochemistry ◆ Electrochemistry—Ionics ◆ Electrochemical Cells ◆ Polarography ◆ Group Theory

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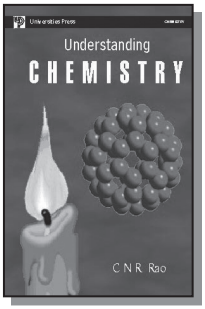
2011	**592 pp.**	**Paperback**
978–81–7371–726–0		**₹ 995.00**

Understanding Chemistry

C N R Rao
Linus Pauling Research Professor & Honorary President
Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India



This supplementary book and multimedia package for students from senior school and first year B.Sc. is intended to bring out the excitement of chemistry and encourage more students to pursue this subject further. It explains the Hows and Whys of chemistry to whet the appetite of a good student.

Contents: *Preface* ◆ CHEMISTRY IN A CAPSULE - What is matter made of? ◆ What are we made of? ◆ Let us observe chemical changes ◆ Let us prepare a few element gases ◆ Atomic and molecular nature of substances ◆ Laws of chemical combination; Man and metals ◆ Classification of substances ◆ Electrolysis ◆ Carbon compounds ◆ States of substances ◆ Materials; Similar looks but different properties ◆ Pure and impure ◆ Explosions and fireworks ◆ The food we eat ◆ Our atmosphere ◆ Water ◆ Conclusions ◆ ELEMENTS AND THE PERIODIC TABLE - Modern concept of elements ◆ The modern atom ◆ Arranging elements ◆ The modern periodic table ◆ Periodic table and properties of elements ◆ Coming back to the story of elements ◆ Conclusions ◆ THE CHEMICAL BOND - How are chemical bonds formed? ◆ Ionic bond ◆ Covalent bond ◆ Bond distances and bond energies ◆ Resonance ◆ Coordinate bond ◆ Metallic bond ◆ Conclusions ◆ STRUCTURE AND SHAPES OF MOLECULES - What are the factors that determine the shapes of simple molecules? ◆ Hybridization ◆ Shapes of simple molecules ◆ Isomers ◆ Some complex structures and shapes ◆ The hydrogen bond ◆ Molecules of life ◆ Man-made polymers ◆ Conclusions ◆ CHEMICAL ENERGY - Energy changes in chemical reactions ◆ Nature of energy ◆ Heat of reactions ◆ Energy storage ◆ Energy from the sun ◆ Future options ◆ Conclusions ◆ CHEMICAL REACTIONS - Which reactions occur? ◆ Chemical equilibrium ◆ Rates of reactions ◆ Factor that affect reaction rates ◆ How reactions occur ◆ Some reactions ◆ Redox reactions ◆ Catalysis ◆ Chemical synthesis ◆ Supermolecular Chemistry ◆ Conclusions ◆ TWO CHEMISTS - Michael Faraday ◆ Linus Pauling ◆ Some Chemical Records ◆ *Index*

1999	252 pp.	Paperback
978–81–7371–250–0		₹750.00

Environmental Science

Dimensions in Environmental and Ecological Economics

Amita Kumari Choudhury (Ed.)
Reader, P G Department of Economics, Berhampur University, Ganjam, India

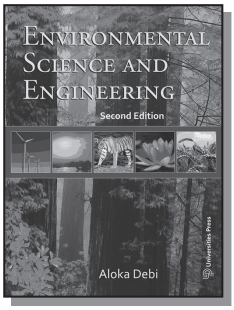
Nirmal Chandra Sahu (Ed.)
Reader, Department of Economics, Berhampur University, Ganjam, India

Environmental and ecological economics is a transdisciplinary branch of knowledge. It covers the study of the processess of simultaneity involved in the functioning of the economy and the environmental/ecological system, with a view to promoting human well-being sustainably. During the last three decades numerous difficult environmental problems of humanity have been explored and analysed which have enlarged its frontiers. Yet the vast mass of literature on the subject remain diffused in a variety of study materials not easily accessible to students. *Besides covering the paradigmatic bases of environmental, ecological and natural resource economics, this book discusses the economic dimensions of and approaches to pollution, environmental and ecosystem management, biodiversity, global warming, energy and resource use, environmental evaluation and sustainable development.*

Available in e-book format only.
For details, visit www.universitiespress.com.

Environmental Science and Engineering, Second Edition

Aloka Debi
Retired Professor of Chemistry, Kingston Engineering College, Kolkata
Retired Senior Lecturer in Chemistry and Environmental Science, Government Polytechnic, Kolkata.



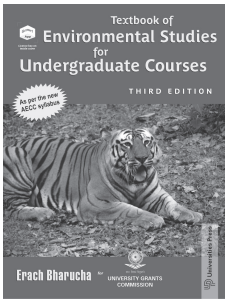
Environmental Science and Engineering has been specially designed to explain what the environment is, how it is polluted and destroyed, the effects of pollution, and how effectively the damage to the environment can be controlled. The second edition of the book incorporates more insights into prevention against pollution, new case studies, as well as a chapter on 'Recent Sources of Pollution' that includes marine, thermal and nuclear pollution.

Special Features:
- discusses the **acts and laws** that govern pollution
- provides a number of relevant **case studies**
- suggests **solutions** to the environmental problems
- provides **extensive exercises**
- is based on the **undergraduate syllabus prescribed by the UGC** for engineering students throughout India

2012 **268 pp.** **Paperback**
978–81–7371–811–3 **₹ 595.00**

Textbook of Environmental Studies for Undergraduate Courses
(Third Edition)

Erach Bharucha
Director, Bharati Vidyapeeth Institute of Environment Education and Research, Pune, India



Online resources available

For a decade and a half, this book has been considered the most reliable textbook on the subject for all undergraduate students. This third edition has been revised as per the new AECC syllabus set down by the UGC and has been made extremely user-friendly. The aim of this book is not only to create an awareness of environmental issues, but also to bring about pro-environmental action.

The new, two-colour design of this edition will appeal to students and aid in reading and retention. The unique feature of this textbook is the accompanying App containing additional questions, colour pictures and video lectures.

Salient features:
- Tailored precisely to the AECC curriculum set down by the UGC.
- Relevant case studies, examples and photographs create an interest in the reader.
- Colour plates showing the biogeographical zones, and various species of flora and fauna, add value to Unit 4.
- Questions that induce reflection and follow-up action are highlighted in boxes and provide a thought-provoking feature.
- The thread of 'sustainable living' runs through the entire book, thus awakening the students to reality and suggests solutions for commonly encountered environmental issues.
- The exclusive App provides various types of practice questions (MCQs, fill up the blanks, match the following), colour pictures and video lectures to aid the student in revising on-the-go.

Online resources available at:
www.universitiespress.com/tbevsugbybharucha

Contents: *Foreword ◆ Preface to the Third Edition ◆ Preface to the First Edition ◆ Acknowledgements ◆*

Introduction to Environmental Studies ◆ Ecosystems ◆ Natural Resources: Renewable and Non-Renewable Resources ◆ Biodiversity and Conservation ◆ Environmental Pollution ◆ Environmental Policies and Practices ◆ Human Communities and the Environment ◆ Field Work ◆ *Index*

2021	**288 pp.**	**Paperback**
978-93-89211-78-8		**₹ 375.00**

Materials Science

Universities Press-IIM Series in Metallurgy and Materials Science

The study of metallurgy and materials science is vital for developing advanced materials for diverse applications. In the last decade, the progress in this field has been rapid and extensive. To make this growing volume of knowledge available, an initiative to publish a series of books in Metallurgy and Materials Science was taken during the Diamond Jubilee year of the Indian Institute of Metals (IIM) in the year 2006. This series is co-published by Universities Press, associate of Orient Blackswan, with its long tradition of publication of quality books in engineering and sciences, and, IIM which is a premier professional body representing an eminent and dynamic group of metallurgists and materials scientists from R&D institutions, academia and industry in India.

This series includes different categories of publications—textbooks to satisfy the requirements of undergraduates and beginners in the field, monographs on select topics by experts in the field, and proceedings of select international conferences organized by IIM after mandatory peer review. These publications will serve as a source of knowledge to a wide spectrum of students, engineers, researchers and industrialists in the field of metallurgy and materials science.

Advances in Stainless Steels

Baldev Raj
Distinguished Scientist and Director, Indira Gandhi Centre for Atomic Research, Kalpakkam, India

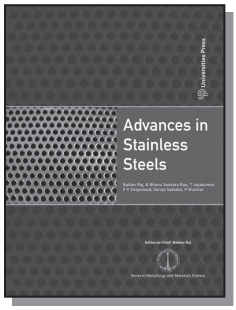
K Bhanu Sankara Rao
Professor and Dean, School of Engineering Sciences and Technology, University of Hyderabad, India

T Jayakumar
Outstanding Scientist and Director, Metallurgy and Materials Group, Indira Gandhi Centre for Atomic Research, Kalpakkam, India

P V Sivaprasad
Deputy General Manager, Sandvik Materials Technology R&D, Pune, India

Saroja Saibaba
Head, Nuclear Materials and Microscopy Section, Indira Gandhi Centre for Atomic Research, Kalpakkam, India

P Shankar
Principal, Nehru College of Engineering and Technology, Coimbatore, India



The book focuses on various facets—processing, component design, properties, fabrication and applications—of the wonder alloy: stainless steel. It covers a broad spectrum of topics spanning the entire life cycle of stainless steel—from alloy design and characterization to engineering design, fabrication, mechanical properties, corrosion, quality assurance of components, in-service performance assessment, life prediction and failure analysis of materials and components. The book comprises articles that bring out contemporary developments in stainless steels and is thematically classified into:

- Component design, modelling and structural integrity
- Manufacturing technology
- Property evaluation
- Alloy development and applications
- Non-destructive evaluation methods
- Corrosion and surface modification

The articles are of high relevance to manufacturers, fabricators, researchers, designers, suppliers and end users of stainless steel, and serve as a valuable source for everyday reference and as a guide for challenges connected with alloy design, material selection, melting, processing, fabrication, metallurgy and applications.

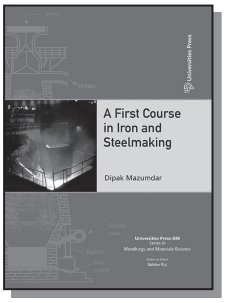
Distributed worldwide by CRC Press LLC, USA, Taylor and Francis Group, except in India, Pakistan, Bangladesh, Sri Lanka, Nepal and Bhutan.

2010 **692 pp.** **Hardback**
978-81-7371-696-6 **₹ 4,140.00**

First Course in Iron and Steelmaking, A

PRINT ON DEMAND

Dipak Mazumdar
Distinguished Ministry of Steel Chair Professorship, IIT Kanpur



According to the author, the requirements for a text of this kind are: it should be concise and contemporary, less descriptive, based on fundamentals and sufficiently quantitative. This is because courses on extractive metallurgy, mineral processing, fuels, furnaces and refractories have been dispensed with to accommodate newer subjects related to structure, properties and processing of different kinds of emerging and functional materials such as refractories, polymers and composites. *A First Course in Iron and Steelmaking* is a textbook catering to undergraduate metallurgical engineering students that fulfils all these criteria. The author's experience in more than a dozen domestic steel and refractory industries has added flavour and value to the concepts presented in the book.

Salient features:

- It is a comprehensive book featuring the status of the Indian iron and steel industry, the processes followed in extraction, the traditional, contemporary as well as those expected to be followed in the future.
- Each process has been described with their advantages and disadvantages cited.
- Contains a large number of numerical worked examples as well as exercises.
- Exercises are structured to help students in developing their understanding of fundamental concepts through self-study.
- Includes appropriate figures, diagrams and tables close to the point of reference.
- Excellent resource material has been provided in each chapter to assist readers to study the subject in greater detail.

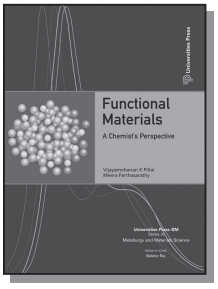
Contents: *Preface* ◆ An Overview of Iron and Steelmaking ◆ The Science Base of Iron and Steelmaking ◆ Ironmaking ◆ Steady State Material and Enthalpy Balance in an Iron Blast Furnace ◆ Primary Steelmaking ◆ De-oxidation, Ladle and Tundish Metallurgy ◆ Solidification of Steel, Casting Processes and Finishing Operations ◆ Iron and Steelmaking in India ◆ *Index*

2015 **396 pp.** **Paperback**
978-81-7371-939-4 **₹ 1,895.00**

Functional Materials: A Chemist's Perspective

Vijayamohanan K Pillai
Director, CSIR–Central Electrochemical Research Institute, Karaikudi; Director (Additional Charge)CSIR – National Chemical Laboratory, Pune, India

Meera Parthasarathy
Assistant Professor, Department of Chemistry, School of Chemical & Biotechnology, SASTRA University, Thanjavur, India



This book introduces the reader to the basic concepts, lines of development, main characteristics and applications of functional materials. Several

examples of functional materials developed during the last two decades are used to illustrate their versatility and range of function. This book examines the preparation and characterization of some of these materials from the perspective of a synthetic chemist. Although research in this area is multidisciplinary, the chemistry of these materials is given special importance. *Existing and emerging applications of functional materials in energy storage, polymer electronics, chemical sensors, nanobiotechnology and medicine are highlighted.*

Salient Features: Selection of topics based on curriculum and current interest ◆ Numerous examples and illustrations ◆ Colour plates to enhance understanding ◆ Further Reading and Exercises at the end of every chapter

This book lucidly explains various aspects of functional materials, beginning from fundamental definitions to specific applications and methods of introducing functions, emerging synthetic tools and many attendant challenges. The authors admirably unravel the subject's multi-disciplinary breadth and convey their smart understanding of the new innovative trends in the design, synthesis and manufacture of new materials. They elegantly combine various aspects of molecular design, material preparation, organization, characterization and applications with many fascinating, real-life examples.

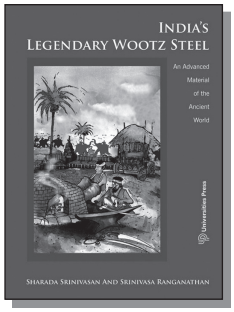
— R A Mashelkar
National Research Professor, CSIR Bhatnagar Fellow & President, Global Research Alliance
National Chemical Laboratory, Pune, India

2012	408 pp.	Paperback
978–81–7371–768–0		₹ 1,110.00

India's Legendary Wootz Steel

Sharada Srinivasan
Professor, National Institute of Advanced Studies, Indian Institute of Science, Bengaluru, India

Srinivasa Ranganathan
Indian Institute of Science, National Institute of Advanced Studies, Bengaluru, India



A fascinating history of India's legendary high-grade steel—wootz steel—which was highly prized and much sought after across the world for over two millennia. Wootz steel was used to make the fabled Damascus blades.

Although Indian wootz steel was such an important material in the metallurgical history of mankind, there are no books devoted to Indian contributions. First brought out by Tata Steel in November 2004 as a celebration of the twin centenaries of J.N. Tata and J.R.D.Tata, the book has been widely acclaimed. *It is both scholarly as well as highly readable at the level of popular archaeo-science.*

Original cartoons that are both colourful and humorous have been added to make the book more interesting and bring alive the times in which important developments were made.

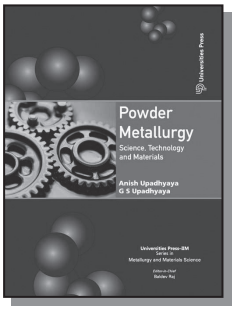
2014	160 pp.	Hardback
978–81–7371–721–5		₹ 2,400.00

Powder Metallurgy: Science, Technology and Materials

PRINT ON DEMAND

Anish Upadhyaya
Associate Professor, Department of Materials Science and Engineering, IIT Kanpur, Kanpur

G S Upadhyaya
Retired Professor, Department of Materials and Metallurgical Engineering, IIT Kanpur, Kanpur



Since the 1920s modern powder metallurgy has been used to produce a wide range of structural Powder Metallurgy (PM) components, self-lubricating bearings and cutting tools. The conventional method involves the production of metal powders, and manufacture of useful objects from such powders by die compaction and sintering. Wrought products are also produced by this route. Powder injection moulding permits the production of stronger, more uniform and more complex PM parts. A detailed discussion of PM materials and products is given in the book.

The book serves as a textbook (both for undergraduate and postgraduate courses in engineering) and also as a handy reference book for engineers in the PM industry. In order to aid and broaden the problem-solving capability of students, worked examples are included in each chapter. In the end of chapter exercises, a variety of questions and problems are included.

Contents: Introduction ◆ Powder Production and Characterisation ◆ Powder Treatment ◆ Powder Compaction ◆ Sintering ◆ Full Density Processing ◆ Secondary Treatments of P/M parts ◆ Applications ◆ Holistic View of P/M Science and Technology ◆ *Questions and Problems* ◆ *Further Readings* ◆ **Powder Production** ◆ Chemical Methods ◆ Electrolytic Method ◆ Evaporation Method ◆ Mechanical Method ◆ *Questions and Problems* ◆ *Further Readings* ◆ **Powder Characterisation** ◆ Chemical Composition and Structure ◆ Particle Size and Shape ◆ Particle Surface Topography ◆ Surface Area ◆ Apparent and Tap Densities ◆ Flow Rate ◆ Compressibility ◆ Green Strength ◆ Pyrophorocity and Toxicity ◆ Powder Production Methods and Characteristics Relations ◆ *Questions and Problems* ◆ *Further Readings* ◆ **Powder Treatment** ◆ Annealing and Diffusion Alloying ◆ Powder Mixing / Milling ◆ Granulation 4.4 Coating on Metal Powders ◆ Powder Degassing ◆ *Questions and Problems* ◆ *Further Readings* ◆ **Powder Compaction** 5.1 Basic Aspects ◆ Die Compaction ◆ Warm Compaction ◆ Wet Compaction ◆ Cold Isostatic Compaction ◆ Powder Roll Compaction ◆ Powder Extrusion ◆ Injection Moulding ◆ Green Part Materials Handling ◆ *Questions and Problems* ◆ *Further Readings* ◆ **Pressureless Powder Shaping** ◆ Slip Casting / Slurry Moulding ◆ Tape Casting ◆ Electrophoretic Deposition ◆ Spray Deposition / Forming ◆ Solid Preform Fabrication ◆ Questions and Problems ◆ Further Readings ◆ **Sintering Theory** ◆ Solid State Sintering ◆ Activated Solid State Sintering ◆ Liquid Phase Sintering ◆ Activated Liquid Phase Sintering ◆ *Questions and Problems* ◆ *Further Readings* ◆ **Sintering Technology** ◆ Debinding of Powder Compacts ◆ Loose Sintering ◆ Sintering Furnaces ◆ Sintering Zones ◆ Rapid Sintering Processes ◆ Sintering Atmosphere ◆ Sintering Atmosphere Analysis and Control ◆ Process Variables ◆ Materials Variables ◆ Dimensional Changes ◆ Microstructural Changes ◆ Infiltration ◆ Sintered Parts Materials Handling ◆ *Questions and Problems* ◆ *Further Readings* ◆ **Full Density Consolidation** ◆ Dynamic Powder Compaction ◆ Hot Pressing ◆ Hot Isostatic Pressing ◆ Powder Hot Extrusion ◆ Powder Hot Forging ◆ Powder Preform Rolling ◆ Spark Sintering ◆ Questions and Problems ◆ Further Readings ◆ **Secondary Treatments** ◆ Sizing ◆ Machining ◆ Impregnation ◆ Surface Engineering ◆ Heat Treatment ◆ Joining ◆ *Questions and Problems* ◆ *Further Readings* ◆ **Testing and Quality Control of P/M Materials and Products** ◆ Sampling ◆ Density ◆ Sintered Porosity and Pore Distribution ◆ Structure of Sintered Materials ◆ Differential Thermal Analysis ◆ Thermal Expansion ◆ Thermal Shock Resistance ◆ Thermal Conductivity ◆ Optical Properties ◆ Hardness ◆ Strength ◆ Impact Test ◆ Fracture Toughness ◆ Fatigue Behaviour ◆ Creep Behaviour ◆ Fracture Behaviour ◆ Wear Resistance ◆ Electrical Resistivity ◆ Magnetic Properties ◆ Corrosion Resistance ◆ Quality Control Aspects of P/M Parts ◆ *Questions and Problems* ◆ *Further Readings* ◆ **Metallic and Ceramic P/M Materials** ◆ Low Alloy Steels ◆ High Alloy Steels ◆ Copper Alloys ◆ Aluminium Alloys ◆ Silver Alloys ◆ Nickel Alloys ◆ Titanium Alloys ◆ Refractory Metals and Alloys ◆ Intermetallics ◆ Ceramic Systems ◆ Cermets ◆ Ceramic–Ceramic Composites ◆ *Questions and Problems* ◆ *Further Readings* ◆ **P/M Applications** ◆ Structural Applications ◆ Machine Tool Applications ◆ Power Generation Applications ◆ Filter Applications ◆ Friction Applications ◆ Electrical Applications ◆

Magnetic Applications ◆ Oxygen Sensor Applications ◆ Thermal Management Applications ◆ Bio-Implant Applications ◆ *Questions and Problems* ◆ *Further Readings* ◆ **Techno-economics of P/M Processing** ◆ Costs of Metal and Ceramic Powders ◆ Economics of Metal Powder Production Methods ◆ Economic Aspects of Sintered Parts ◆ Energy Aspects of Sintering Process ◆ Economic Aspects of Full Density Consolidation ◆ Economic Aspects of Powder Injection Moulding ◆ Economic Aspects of Secondary Treatments ◆ Economic Aspects of Outsourcing ◆ *Questions and Problems* ◆ *Further Readings*

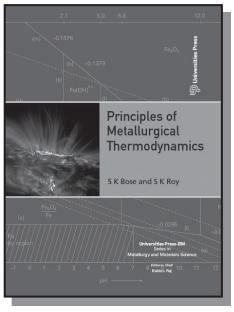
Distributed worldwide by CRC Press LLC, USA, Taylor and Francis Group, except in India, Pakistan, Bangladesh, Sri Lanka, Nepal and Bhutan.

2011	536 pp.	Paperback
978–81–7371–717–8		₹1,200.00

Principles of Metallurgical Thermodynamics

Subir Kumar Bose (Late)
Professor, IIT Kharagpur, Kharagpur

Sanat Kumar Roy
Professor, IIT Kharagpur, Kharagpur



The book deals with the thermodynamics of reactive systems, with emphasis on the reactivity of metals and materials being used by metallurgical and materials scientists all over the world. Though the focus is on equilibrium thermodynamics, it also touches upon some methods to incorporate non-equilibrium effects relevant to material scientists. This knowledge will enable students to solve the challenging problems faced during operation in different materials-processing routes. It will also help in the search for new substances that might revolutionize high as well as low temperature applications because of their super-fluid and super-conducting properties, outer space environmental adaptability and more attractive electrical, magnetic and dielectric properties.

Salient features:

- Contains a large number of numerical solved problems as well as exercises (with answers).
- Structures the exercises to help students in developing their understanding of fundamental concepts through self study.
- Introduces new topics not commonly found in other textbooks on metallurgical thermodynamics,
- Includes appropriate figures, diagrams and tables close to the point of reference.
- Provides references to assist readers to find the source material for further studies.

Contents: *Preface* ◆ *Nomenclature, Symbols, Units and Dimensions* ◆ Introduction ◆ Concept of Internal Energy and the First Law of Thermodynamics ◆ Concept of Entropy and the Second Law of Thermodynamics ◆ Temperature Dependence of Heat Capacities, Entropy and the Third Law of Thermodynamics ◆ Homogeneous and Heterogenous Equilibria, Fugacity, Activity and Equilibrium Constant ◆ Ellingham–Richardson Diagrams ◆ Phase Rule and Phase Relations, Phase Stability and Thermochemical Diagrams ◆ Phase Equilibrium and Phase Transformation in Metals Under High Pressures ◆ Thermodynamics of Special Systems ◆ Thermodynamics of Solutions ◆ Thermodynamics of Electrochemical Cells and Solid Electrolytes ◆ Thermodynamics of Point Defects in Binary Inorganic Compounds ◆ Thermodynamics of Surfaces and Interfaces ◆ *Index*

2014	688 pp.	Paperback
978–81–7371–927–1		₹1,350.00

Textbook of Nanoscience and Nanotechnology

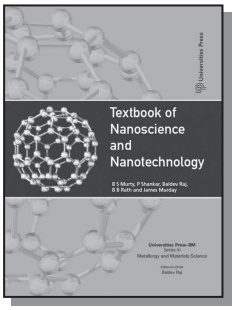
B S Murty
Professor, Department of Metallurgical and Materials Engineering, Indian Institute of Technology Madras, Chennai, India

P Shankar
Principal, Saveetha School of Engineering, Saveetha University, Chennai, India

Baldev Raj
Director, National institute of Advanced Studies, Indian Institute of Science Campus, Bengaluru, India

B B Rath
Director, Materials Science and Component Technology, Naval Research Laboratory, Washington DC, USA

James Murday
Naval Research Laboratory, Washington DC, USA



It is a book for beginners in the field of nanoscience and nanotechnology and is *suitable for both undergraduate and postgraduate students who are taking a course in nanoscience and nanotechnology*. It provides an introduction to the terminology and historical perspectives of this domain of science, discusses the effects of size and the unique and widely differing properties of nanomaterials in comparison to bulk materials, and describes the advances in methods of synthesis, and consolidation and characterization techniques. The applications of nanoscience and technology and emerging materials and technologies are also presented in the book.

Special Features: Current data and research findings, with special emphasis on Indian sources, included in every chapter ◆ Exercises and problems at the end of each chapter ◆ Glossary and Index

Contents: The big world of nanomaterials ◆ Unique properties of nanomaterials ◆ Synthesis routes ◆ Applications of nanomaterials ◆ Tools to characterize nanomaterials ◆ Nanostructured materials with high application potential ◆ Concerns and challenges of nanotechnology

2012 **248 pp.** **Paperback**
978-81-7371-738-3 **₹ 825.00**

Pharmaceutical Science

Chemistry of Natural Products: A Unified Approach
(Second Edition)

N R Krishnaswamy
Formerly Professor, Department of Chemistry, All India Institute of Medical Sciences, New Delhi; Sri Sathya Sai Institute of Higher Learning, Puttaparthi, India

See page 11

Chemistry of Natural Products: A Laboratory Handbook

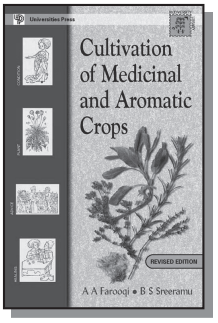
N R Krishnaswamy
Formerly Professor, Department of Chemistry, All India Institute of Medical Sciences, New Delhi; Sri Sathya Sai Institute of Higher Learning, Puttaparthi, India

See page 11

Cultivation of Medicinal and Aromatic Crops

PRINT ON DEMAND

A A Farooqi & B S Sreeramu



In recent years, there has been a tremendous growth of interest in plant-based drugs, pharmaceuticals, perfumery products, cosmetics and aromatic compounds used in food flavours, fragrances, and natural colours. An attempt has been made in this book to provide all possible pooled information

including the research findings that have been generated by the Division of Horticultural Sciences, the University of Agricultural Sciences, the Indian Institute of Horticultural Research, the Central Institute of Medicinal and Aromatic Crops, the National Botanical Research Institute, the Regional Research Laboratories, ICAR and others.

2004	344 pp.	Paperback
978–81–7371–504–4		₹ 1,695.00

Experimental Pharmacology
(Second Edition)

M C Prabhakar
Formerly Senior Professor and Head, Department of Pharmacology, Sri Vishnu College of Pharmacy, Bhimavaram, India

This book is a unique compendium of experiments on drug response patterns. Students can easily understand the essential theoretical principles of the behaviour of drug agents by analyzing the results. Keeping Indian conditions in mind, locally available material has been used. In this revised second edition, a new experimental animal, the chick has been added.

Contents: Effect of Different Agonists on Blood Pressure Preparation ◆ New and Modified Techniques ◆ Thrills, Paradoxes and Chills ◆ Experiments on Rabbit ◆ Experiments on Chick ◆ Experiments on Cat ◆ Experiments on Guinea Pig ◆ Experiments on Dog ◆ Some Psychopharmacology Techniques ◆ Points to Remember ◆ Some Autonomic Drug Interactions in: I. Anesthetised Rat (Sets 1–18): II. Anesthetised Dog (Sets 19–33)

2013	248 pp.	Paperback
978–81–7371–820–5		₹ 675.00

Herbal Drug Technology
(Second Edition)

S S Agrawal
Formerly Professor and Head, Department of Pharmacology; Principal, Delhi Institute of Pharmaceutical Sciences and Research, New Delhi, India

M Paridhavi
Principal, Rajiv Gandhi Institute of Pharmacy, Kasargod, India

The second edition of the textbook *Herbal Drug Technology*, based on the curriculum of various universities, caters to both bachelor's and master's courses in pharmacy and allied sciences. It contains detailed information on Indian systems of medicine, herbal therapeutics, crude drugs and medicinal botany. New to this edition are topics such as herbal cosmetics, nutraceuticals, chemotaxonomy, recent changes in in vivo anticancer screening models and screening of cardiac glycosides, and methods of literature search and patenting of herbal drugs.

Special Features: *Designed according to the curriculum of undergraduate and postgraduate courses in pharmacy of various universities in India and abroad* ◆ Incorporates recent advances in technology ◆ Provides a comparative study of dosage forms in ayurveda and modern medicine ◆ Includes a detailed analysis of more than 60 phytopharmaceuticals ◆ Discusses standardization of herbal drugs—WHO protocol, different methods used for standardization, quality control standards for herbal extracts and validation of herbal products

Contents: *Second Message* ◆ *First Message* ◆ *Foreword* ◆ *Preface to the Second Edition* ◆ *Preface to the First Edition* ◆ Introduction to Medicinal Plants ◆ Indian Systems of Medicine ◆ Herbal Therapeutics: From Ancient Times to the 21st Century ◆ Essentials of Crude Drugs ◆ Medicinal Botany ◆ In vitro Culture of Medicinal Plants: Tissue Culture ◆ Systematic Examination of Powdered Drugs ◆ Screening Methods Used for Herbal Drugs ◆ Standardisation of Herbal Drugs ◆ Herbal Formulations: A Comparative Study of Ayurvedic and Modern Dosage Forms ◆ Herbal Cosmetics ◆ Nutraceuticals: A Modern Approach ◆ Chemotaxonomy ◆ The Role of Literature Search in Medicinal Plant Research ◆ Patenting of Herbal Drugs ◆ *List of Plates* ◆ *Plate 1a Callus culture* ◆ *Plate 1b Plantlets formed from callus culture* ◆ *Plate 2 Shoot elongation and rooting of in vitro regenerated shoots* ◆ *Plate 3 Plantlets acclimatised to greenhouse conditions* ◆ *Plate 4 Immobilised beads*

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2012	836 pp.	Paperback
978–81–7371–787–1		₹ 1,950.00

Indian Medicinal Plants: A Compendium of 500 Species

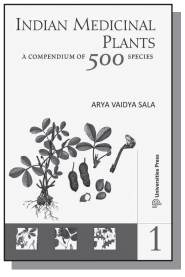
P K Warrier
Managing Trustee, Arya Vaidyasala, Kottakal, India

V P K Nambiar
Formerly Systematic Botanist, Kerala Forest Research Institute, Peechi, India

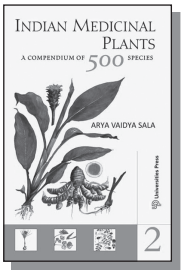
C Ramankutty
Arya Vaidyasala, Kottakal, India

This compendium which is based on a treatise prepared by S Raghunatha Iyer, a scholar of both Sanskrit and Ayurveda, aims to make an authoritative contribution to the field. The original work which drew upon classical texts and current research, as well as the oral medical knowledge of tribal groups has been updated by scholars associated with the Arya Vaidya Sala in Kottakal, India. This unique compendium offers profiles of 500 key species with detailed taxonomic information. One of the leading features of this compilation is the special technique used in the illustrations, both colour and line, which aims to achieve authenticity of texture, colour and form.

The compendium also lists the distribution and popular nomenclature in English, Sanskrit, Hindi, Malayalam and Tamil. The main texts present properties and uses in a format which cites ancient verse texts and ethnobotanical sources. This rare work, in five volumes, should be of special interest to practitioners of alternative medicine, students of Ayurveda, the research and industry associated with medical botany, pharmacologists, sociologists and medical herbalists.



Volume 1 **1993** **430 pp.**
978–93–89211–08–5 **Paperback** **₹ 2,520.00**



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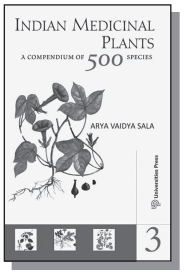

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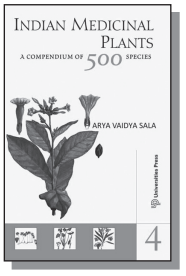
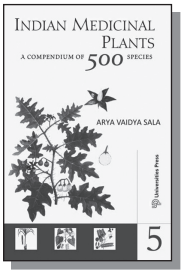


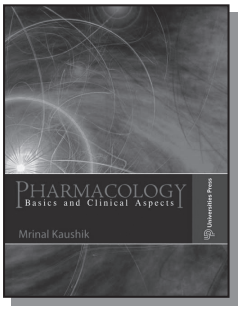
Volume 4 **1995** **444 pp.**
978–93–89211–11–5 **Paperback** **₹ 2,520.00**



Volume 5 **1996** **592 pp.**
978–93–89211–12–2 **Paperback** **₹ 2,520.00**

Pharmacology: Basics and Clinical Aspects

Mrinal Kaushik
Senior Medical Officer (SMO), Central Health Service (CHS), Ministry of Health & Family Welfare, Government of India, posted at Dr Ram Manohar Lohia Hospital (Dr RMLH), New Delhi, India



This book presents the fascinating but complex subject of Pharmacology in a concise and clinically relevant manner. It discusses Pharmacology from a perspective that can be readily identified by students in the context of actual clinical situations. Unlike most books, which tend to test the student's memory skills, the emphasis here is on a logic-based understanding of pharmacology. This would enable students to easily comprehend and, more importantly, to retain the information presented.

In this book, the different types of drugs, their mechanisms of action, rationale for drug interactions and side effects have been discussed in detail. In keeping with the highly dynamic nature of the subject and the vast clinical research underway, the latest and most widely accepted views are provided at every juncture.

Contents: *Section 1:* General Pharmacology—Routes of Drug Administration ◆ Drug Absorption and Distribution ◆ Drug Metabolism and Excretion ◆ Pharmacodynamics ◆ *Section 2:* Drugs Acting on the Cardiovascular System—Antihypertensive Drugs ◆ Antiarrhythmic Drugs; *Section 3:* Drugs Acting on the Central Nervous System—Anaesthesia and Anaesthetic Agents ◆ Antiepilepsy Drugs ◆ Drug Therapy of Alzheimer's Disease ◆ Drug Therapy of Parkinson's Disease ◆ Antidepressant Drugs ◆ Neuroleptics ◆ Drug Therapy of Migraine ◆ *Section 4:* Drugs Acting on the Renal System—Diuretic Agents ◆ *Section 5:* Antimicrobial Drugs—Antibacterial drugs ◆ Antifungal Drugs ◆ Antitubercular Drugs ◆ Antimalarial Drugs ◆ Antiretroviral Drugs ◆ Anti viral Drugs ◆ Anthelmintic Drugs ◆ *Section 6:* Drugs Acting on the Gastrointestinal System—Drug Therapy of Acid Peptic Disorders ◆ Antiemetic Drugs ◆ Drug-induced Hepatotoxicity ◆ *Section 7:* Drugs Acting on the Respiratory System—Drug Therapy of Bronchial Asthma ◆ *Section 8:* Anticancer Drugs—Cancer Chemotherapy Drugs ◆ *Section 9:* Drugs Acting on the Metabolic and Endocrine Systems—Antidiabetic Drugs ◆ Antiobesity Drugs ◆ Drug Therapy of Hyperlipoproteinemias ◆ *Section 10:* Neurotransmitters and Drugs Effective in Neurotransmission Defects—Noradrenergic and Adrenergic system ◆ Dopaminergic System ◆ Serotonergic System ◆ Cholinergic System ◆ *Section 11:* Inflammation and Anti-inflammatory Drugs—Prostaglandins ◆ Corticosteroids ◆ Non-steroidal Anti-inflammatory Drugs (NSAIDs) ◆ *Section 12:* Effect of Concomitant Use of Multiple Drugs—Drug Interactions ◆ *Answer key* ◆ *Index*

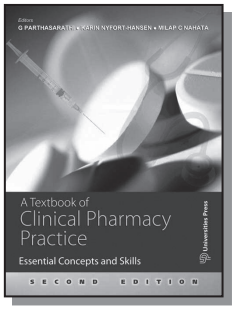
2011 **752 pp.** **Paperback**
978–81–7371–694–2 **₹ 1,095.00**

Textbook of Clinical Pharmacy Practice (Second Edition)

G Parthasarathi (Ed.)
Dean, Faculty of Pharmacy; Professor, Pharmacy Practice, J S S University, Mysore, India

Karin Nyfort-Hansen (Ed.)
Research Pharmacist and Clinical Trial Co-ordinator, School of Medicine, The University of Adelaide, Australia

Milap C Nahata (Ed.)
Professor and Chair of Pharmacy Practice and Administration, College of Pharmacy, The Ohio State University, Columbus, USA



This book aims to equip pharmacists with the knowledge and skills required to discharge their

clinical pharmacy practice responsibilities in the Indian scenario. The focus is on providing information about how clinical pharmacy is practiced rather than what they need to know about drugs and therapeutics.

Completely revised and updated, this edition includes four new chapters: *Community Pharmacy Practice, Medication Use in Pregnancy and Lactation, Ethical Issues in Clinical Research and Poison Information.* These chapters address practice areas of great relevance to Indian pharmacists and result in a more comprehensive text overall.

A balanced mix of content, case studies, references and website links has been provided to make the topics as clear and interesting to the reader as possible. Additional appendices comprise laboratory reference values for adults and how to take medication history.

Salient Features: New and revised chapters ◆ Additional tables, sample forms and appendices ◆ Learning objectives and key messages for every chapter ◆ New case studies, practice scenarios and exercises ◆ Updated glossary

Contents: *Foreword to the Second Edition* ◆ *Foreword to the First Edition* ◆ *Preface to the Second Edition* ◆ *Abbreviations* ◆ Clinical Pharmacy in India ◆ Clinical Pharmacy: An International Perspective ◆ Community Pharmacy Practice ◆ Key Competencies for Clinical Pharmacy Practice ◆ Communication Skills for Pharmacists ◆ Patient Counselling ◆ Medication Adherence ◆ Essential Medicines and Rational Drug Use ◆ Adverse Drug Reactions and Pharmacovigilance ◆ Drug Interactions ◆ Interpreting Laboratory Data: Biochemistry and Haematology ◆ Interpreting Laboratory Data: Infectious Diseases ◆ Medication Review ◆ Ward Round Participation ◆ Paediatric Pharmacy Practice ◆ Clinical Pharmacy for Geriatric Patients ◆ Medication Use in Pregnancy and Lactation ◆ Critical Appraisal: How to Read a Research Paper ◆ Drug Information ◆ Poison Information ◆ Clinical Pharmacokinetics ◆ Therapeutic Drug Monitoring ◆ Continuing Professional Development ◆ Ethical Issues in Clinical Research ◆ Research in Clinical Pharmacy ◆ Drug Utilisation Evaluation ◆ Pharmacoepidemiology ◆ Medication Errors and Adverse Drug Events ◆ Pharmacoeconomics: Theory, Research and Practice ◆ Development of Therapeutic Guidelines ◆ *Appendices* ◆ *Glossary* ◆ *Index*

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2012	**596 pp.**	**Paperback**
978-81-7371-756-7		**₹ 995.00**

Textbook of Industrial Pharmacognosy

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Bindu Sukumaran
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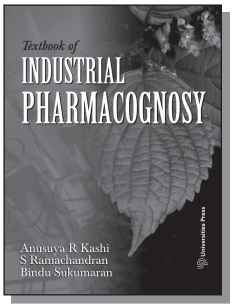


This book is *designed for undergraduate pharmacy students* and provides both contemporary and comprehensive information on herbal drugs. The first three chapters—herbal drug industry, patents and intellectual property rights, and standardization of herbal drugs—are new, and have been culled from diverse sources. The book provides current information, and is organised in a format that enables students to focus on the important aspects.

Contents: Herbal drug industry ◆ Patents ◆ Standardization of herbal drugs ◆ Traditional systems of medicine ◆ Ayurvedic formulations ◆ Traditional drugs ◆ Isolation of compounds from natural sources ◆ Herbal cosmetics ◆ Enzymes ◆ Nutraceuticals ◆ Polyploidy ◆ Plant biotechnology ◆ Protoplast technology ◆ Enzyme biotechnology

Available in print and e-book formats.
For details, visit www.universitiespress.com.

2012	**244 pp.**	**Paperback**
978-81-7371-754-3		**₹ 765.00**

Textbook of Industrial Pharmacy: Drug Delivery Systems, and Cosmetic and Herbal Drug Technology

Shobha Rani R Hiremath
Professor and Head, Department of Pharmacy and Practice, Al-Ameen College of Pharmacy, Bengaluru, India

Textbook of Industrial Pharmacy is a pioneering effort that aims to bring together the three main specialties of pharmaceutical technology—drug delivery systems and industrial pharmacy, cosmetic technology and herbal drugs—in one book. With separate sections on these branches, this book provides detailed information about current techniques, as well as the concepts and principles on which they are based.

Targeted at final year B Pharm and first year M Pharm students, this book includes many step-by-step procedures, illustrations, and examples relating to drug delivery systems, optimisation and validation of pharmaceuticals, herbal drugs and products, cosmetics and cosmeceuticals. In addition, key points and self-assessment questions have been included at the end of every chapter.

Special Features: Systematic and thorough coverage of syllabus topics d Step-by-step procedures d Illustrations that enhance understanding of text d Six full-colour plates d Numerous examples to improve comprehension d Key points and self-assessment questions

Contents: *Section I:* Drug Delivery and Industrial Pharmacy ◆ Introduction to Novel Drug Delivery Systems ◆ Controlled Drug Delivery Systems ◆ Transdermal Drug Delivery Systems ◆ Ocular Drug Delivery Systems ◆ Nasal Drug Delivery Systems ◆ Buccal Drug Delivery Systems ◆ Implant Drug Delivery Systems ◆ Targeted Drug Delivery Systems ◆ Liposomes ◆ Niosomes ◆ Microspheres ◆ Nanoparticles ◆ Methods of Enhancing Bioavailability of Drugs ◆ Pilot Plant and Scale-up ◆ Optimisation Techniques in Pharmaceutical Formulation and Processing ◆ Process Validation ◆ Pollution Control and Effulent treatment in Pharmaceutical Industries ◆ *Section II:* Cosmetic Technology ◆ Raw Materials Used in Cosmetics ◆ Cosmeceuticals ◆ Formulation of Cosemetics ◆ Herbal Cosmetics ◆ Quality control of Cosmetics ◆ Safety and Efficacy of Cosmetics ◆ Stability Testing ◆ Regulatory Aspects of Cosmetics ◆ *Section III*: Herbal Drug Technology ◆ Natural Products and Drug Discovery – A Perspective ◆ Introduction to Isolation, Identification and Estimation of lead Compounds from Natural Products ◆ Quality Control and Standardisation of Herbal Drugs – An Overview

2008	**464 pp.**	**Paperback**
978-81-7371-639-3		**₹ 950.00**

Textbook of Organic Chemistry

C N Pillai
Formerly Professor, Department of Chemistry, Indian Institute of Technology Madras, Chennai, India

See page 21

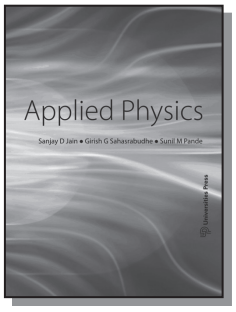
Physics

Applied Physics

Sanjay D Jain
Head, Physics Knowledge Center, Priyadarshini Institute of Engineering and Technology, Nagpur, India

Girish G Sahasrabudhe
Department of Physics, Shri Ramdeobaba College of Engineering and Management, Nagpur, India

Sunil M Pande
Professor of Physics, Shri Ramdeobaba College of Engineering and Management, Nagpur, India



- *Caters to the needs of first- and second-semester undergraduate engineering students and is fully syllabus-compliant*
- Rekindles the interest of engineering students in physics by bringing to the fore the close links between physics and engineering.

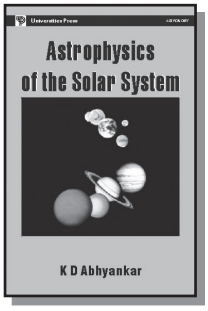
- Uses charts to facilitate a quick understanding of how different topics are related, thereby providing a comprehensive and holistic picture of the subject.
- Use of boxes and highlighted texts to draw readers' attention to important derivations, formulas and special topics that look beyond the syllabus.
- A wide selection of *numerical problems, many drawn from earlier examination papers, for providing adequate problem-solving practice.*

Contents: What is Light? ◆ Interference ◆ Polarisation ◆ Quantum Physics ◆ Semiconductor Physics ◆ Diodes and Transistors ◆ Crystal Structure ◆ Charged Particles in Electric and Magnetic Fields ◆ Lasers ◆ Fibre Optics ◆ Introduction to Nanotechnology

2013	**360 pp.**	**Paperback**
978–81–7371–773–4		**₹ 720.00**

Astrophysics of the Solar System

K D Abhyankar

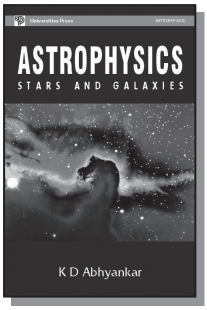


This book attempts to broadly deal with the mechanics and dynamics of the Solar System with additional emphasis on celestial mechanics. Important planetary laws and theories like the Geocentric Theory, Kepler's Laws, Newton's law of gravitation, the catastrophic theories of Moulten, Russel and Schmidt, and the nebular hypothesis of Kant and Laplace are clearly explained. The book also deals with space dynamics and rocket propulsion, solar activities, lunar studies, small bodies and extraterrestrial life.

1999	**272 pp.**	**Paperback**
978–81–7371–124–4		**₹ 875.00**

Astrophysics: Stars and Galaxies

K D Abhyankar

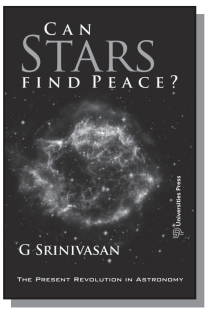


This book introduces the subject of astrophysics to honours and post-graduate students of physics, without the necessity of their being familiar with all the practical details of modern astronomical techniques of observation and deduction of data. The emphasis is on showing how an application of the commonly known laws of physics gives us important information about the properties of celestial objects and phenomena.

2001	**576 pp.**	**Paperback**
978–81–7371–381–1		**₹ 1,380.00**

Can Stars Find Peace?

G Srinivasan
Raman Research Institute, Bangalore



What will happen to a star when its supply of nuclear energy is exhausted? Will it collapse to a point and disappear from this Universe? Or, is there a new twist to the story?

In this book, the second volume of the series '**The Present Revolution in Astronomy**' authored by G Srinivasan, the story of the life history of the stars is narrated in a lucid manner, with the necessary physics background developed in a systematic fashion. The first part deals with

the great developments of the 1930s. This includes the great discovery by Chandrasekhar and the subsequent prediction of supernovae, neutron stars and black holes. The second part of the book is devoted to a discussion of the modern perspective of stellar evolution.

I know of no other book on the evolution of stars of a similar scope and breadth that is so accessible for undergraduate students.

E P J van den Heuvel
Professor of Astrophysics
University of Amsterdam, The Netherland

Contents: *Foreword* ◆ *Preface* ◆ **Part 1: A Historical Perspective** ◆ What Are the Stars? ◆ Stars in Their Youth ◆ White Dwarf Stars ◆ The Principles of Statistical Mechanics ◆ Fermi–Dirac Distribution ◆ Quantum Stars ◆ The Chandrasekhar Limit ◆ The Absurd Behaviour of Stars: Not All Stars Will Have Energy to Cool ◆ Guest Stars ◆ Supernovae, Neutron Stars and Black Holes ◆ *A Profile of Chandra* ◆ **Part II: The Life History of Stars—A Modern Perspective** ◆ To Burn or Not To Burn ◆ What Does the Future Hold for the Sun? ◆ Life History of Intermediate Mass Stars ◆ Diamonds in the Sky ◆ Exploding Stars ◆ *Epilogue* ◆ *Suggested Reading* ◆ *Index*

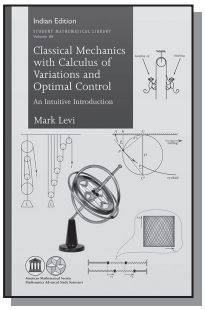
2011	268 pp.	Paperback
978–81–7371–742–0		₹ 725.00

Classical Mechanics with Calculus of Variations and Optimal Control: An Intuitive Introduction

PRINT ON DEMAND

Mark Levi
Professor of Mathematics at Pennsylvania State University, University Park, USA

AMS



This is an intuitively motivated presentation of many topics in classical mechanics and related areas of control theory and calculus of variations. All topics throughout the book are treated with tolerance for unraveling definitions and for proofs which leave the reader in the dark. Some areas of particular interest are an extremely short derivation of the ellipticity of planetary orbits; a statement and an explanation of the 'tennis racket paradox'; a heuristic explanation (and a rigorous treatment) of the gyroscopic effect; a revealing equivalence between the dynamics of a particle and statics of a spring; a short geometrical explanation of Pontryagin's maximum principle, and more. In the last chapter, aimed at more advanced readers, the Hamiltonian and momentum are compared to forces in a certain static problem. This gives a palpable physical meaning to some seemingly abstract concepts and theorems. With minimal prerequisites consisting of basic calculus and basic undergraduate physics, this book is suitable for courses from an undergraduate to a beginning graduate level, and for a mixed audience of mathematics, physics and engineering students. Much of the enjoyment of the subject lies in solving almost 200 problems in this book.

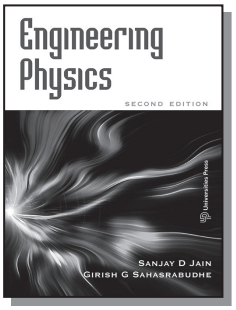
Contents: *Series Foreword: MASS and REU at Penn State University* ◆ *Preface* ◆ One Degree of Freedom ◆ More Degrees of Freedom ◆ Rigid Body Motion ◆ Variational Principles of Mechanics ◆ Chapter 5. Classical Problems of Calculus of Variations ◆ The Conditions of Legendre and Jacobi for a Minimum ◆ Optimal Control ◆ Heuristic Foundations of Hamiltonian Mechanics ◆ *Bibliography* ◆ *Index*

2016	300 pp.	Paperback
978–1–4704–2598–2		₹ 1,160.00

Engineering Physics
(Second Edition)

Sanjay D Jain
Head, Knowledge Center of Priyadarshini Institute of Engineering and Technology, Nagpur.

Girish G Sahasrabudhe
Professor of Physics, Shri Ramdeobaba Kamla Nehru Engineering College, Nagpur



Engineering Physics has been conceived to develop a coherent, comprehensive and practical view of physics among engineering students. This will help them to develop fundamental ways of thinking and inventing in their future engineering practice. The book attempts to break the monotony of just stating theoretical concepts by examining the historical development of the subject, to show interesting links between the various topics. Theory and experiment are integrated and learning through scientific method is emphasized by seeking agreement between theory and experiment. Numerical problems are included at appropriate places to offer quantitative appreciation of parameters involved. Charts are used to facilitate comparative learning of topics that share the same unifying and founding aspects. Applications of each topic are discussed at the end of the chapter to give an idea of how engineering grows through the utilitarian translation of discoveries and concepts in physics. A new chapter on nanophysics has been included, with additional exercises in key chapters.

Contents: Physics and Engineering ◆ The Story of Physics and Engineering ◆ Learning Physics ◆ Theory ◆ Experiment ◆ Seeking Agreement between Theory and Experiment ◆ Applications ◆ What is Light? ◆ The Story of Light ◆ Geometrical and Physical Optics ◆ Wave Equation and Wave Parameters ◆ Light as an ElectromagneticWave ◆ Applications ◆ Interference ◆ The Story of Interference of LightWaves ◆ Superposition of Waves ◆ Coherence ◆ Interference ◆ Applications ◆ Diffraction ◆ The Story of Diffraction ◆ The Phenomenon of Diffraction ◆ Diffraction at Slits ◆ Applications ◆ Polarisation ◆ The Story of Polarisation ◆ Types of Polarisation ◆ Why Natural Light is Unpolarised ◆ Production of Plane Polarised Light ◆ Huygen'sModel of Double Refraction and Production of Elliptically and Circularly Polarised Light ◆ Analysis of Polarised Light ◆ Applications ◆ Quantum Physics ◆ The Story of Quantum Physics ◆ Planck's Quantum Theory ◆ Photoelectric Effect ◆ Compton Effect ◆ Comparison of Photoelectric Effect and Compton Effect ◆ Wave–Particle Duality of Radiation and Concept of Matter Waves ◆ Heisenberg's Uncertainty Principle ◆ Wave Function ◆ Schrodinger's Equation ◆ Applications ◆ Atomic Physics ◆ The Story of Atomic Physics ◆ Atomic Spectra ◆ Bohr's Theory ◆ Application of Quantum Mechanics to Hydrogen Atom ◆ Quantum Numbers and the Periodic Table ◆ Xray Spectra ◆ Applications ◆ Nuclear Physics ◆ The Story of Nuclear Physics ◆ Atomic Nucleus ◆ Radioactivity ◆ Nuclear Models and Spectroscopy ◆ Applications ◆ Structure and Properties of Matter ◆ The Story of Matter ◆ Bonding ◆ Bonding in Solids ◆ Crystal Structure ◆ Miller Indices ◆ Determination of Crystal Structure by Xray Diffraction ◆ Materials and their Properties ◆ Applications ◆ Dielectric and Magnetic Materials ◆ The Story of Dielectric and Magnetic Materials ◆ Electromagnetism in Materials ◆ Microscopic Models of Polarisation and Magnetisation ◆ Internal Field ◆ Ferroelectricity, Ferromagnetism and Related Phenomena ◆ Classification of Materials ◆ Applications ◆ Conductors, Semiconductors and Superconductors ◆ The Story of Conductors ◆ Free Electron Theory of Metals ◆ Formation of Energy Bands in Solids ◆ Fermi Energy and Fermi Level ◆ Semiconductors: Intrinsic and Extrinsic ◆ Superconductivity ◆ Applications ◆ Diodes and Transistors ◆ The Story of Diodes and Transistors ◆ p–n Junction Diode ◆ Transistor ◆ Applications ◆ Charged Particles in Electric and Magnetic Fields ◆ The Story of Charged Particles in Motion ◆ Motion Under a Force ◆ Motion of Charged Particles in Electric and Magnetic Fields ◆ Motion of Charged Particles in Combined Electric and Magnetic Fields ◆ Electron Optics ◆ Applications ◆ Lasers ◆ The Story of Lasers ◆ Introduction ◆ Different Types of Lasers ◆ Characteristics of Laser Light ◆ Semiconductor Photonic Devices ◆ Applications ◆ Fibre Optics ◆ The Story of Fibre Optics ◆ Total Internal Reflection ◆ Structure of an Optical Fibre ◆ Propagation of Light ◆ Wave Optics: Modes ◆ Attenuation ◆ Signal Distortion ◆ Fibre Optic Communication Systems ◆ Applications ◆ Acoustics ◆ The Story of Acoustics ◆ Fundamentals of Vibrations ◆ SoundWaves and their Characteristics ◆ Mechanisms of Speech and Hearing ◆ Classical Ray Theory ◆ Ultrasonics ◆ Applications ◆ Introduction to Nanotechnology ◆ Introduction ◆ Preparation of Nanomaterials ◆ Characterisation and

Measurement ◆ Fullerenes, Graphene and Cargon Nanotubes ◆ Properties and Applications ◆ *Index*

2016	648 pp.	Paperback
978–81–7371–991–2		₹ 1,195.00

Ever Upwards: ISRO in Images

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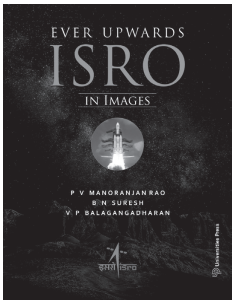
B N Suresh
Chancellor, Indian Institute of Space Science and Technology, Thiruvanthapuram, India; Formerly Director, Vikram Sarabhai Space Centre, ISRO

V P Balagangadharan
Formerly Scientist, Vikram Sarabhai Space Centre, ISRO



The Indian space programme has the unique distinction of being born in a place of worship: the St. Mary Magdalene Church in Thumba, a fishing hamlet near Thiruvananthapuram, the capital of Kerala. From those humble beginnings in 1963, the national space programme grew under the visionary guidance of Vikram Sarabhai and Satish Dhawan to become a technological giant, known today as the Indian Space Research Organisation (ISRO). Sarabhai created ISRO in 1969.

This year, 2019, marks the birth centenary of Sarabhai and the 50th anniversary of ISRO. This book celebrates the double anniversary through over 370 photographs, lovingly curated by the authors from a collection of 2000. Some of them have never before been seen by the public, while others are eye-catchingly beautiful.

The authors have worked on this book for over five years, always keeping abreast with the latest developments in ISRO: from its birth in a church in 1963 to Chandrayaan-2, whose launch is imminent.

This is the story of ISRO told through images. The pictures speak for themselves!

2019	304 pp.	Hardback
978–93–89211–13–9		₹ 4,560

Foundations of Mechanics (Second Edition)

AMS

Ralph Abraham
Department of Mathematics, University of California, Santa Cruz, USA

Jerrold E Marsden
Applied Mathematician and Carl F. Braun Professor of Engineering and Control and Dynamical Systems, California Institute of Technology, Pasadena, USA

For many years, this book has been viewed as a classic treatment of geometric mechanics. It is known for its broad exposition of the subject, with many features that cannot be found elsewhere. *The book is recommended as a textbook and as a basic reference work for the foundations of differentiable and Hamiltonian dynamics.*

Contents: *Part 1:* Preliminaries—Differential Theory ◆ Calculus on Manifolds

Part 2: Analytical Dynamics—Hamiltonian and Lagrangian Systems ◆ Hamiltonian Systems with Symmetry ◆ Hamiltonian-Jacobi Theory and Mathematical Physics

Part 3: An outline of Qualitative Dynamics—Topological Dynamics ◆ Differentiable Dynamics ◆ Hamiltonian Dynamics

Part 4: Celestial Mechanics—The Two-Body Problem ◆ The Three-Body Problem ◆ *Appendix* ◆ *Bibliography* ◆ *Index* ◆ *Glossary of Symbols* ◆ *Errata*

2011	852 pp.	Paperback
978–0–8218–6875–1		₹ 2,770.00

How and Why in Basic Mechanics

Arvind Kumar & Shrish Barve

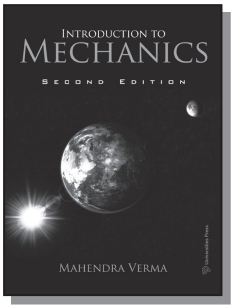
Among the formal physics textbooks, problem manuals and general expository books lies the domain of non-formal physics—the world of content-specific strategies and styles of reasoning that practising physicists employ but do not fully articulate in print. How and Why in Basic Mechanics tries to capture some elements of this

world through the medium of a teacher–student dialogue which runs through the many conceptual barriers that most students and teachers face in different topics of physics, and offers helpful points, clarifications and insights.

2002	296 pp.	Paperback
978–81–7371–420–7		₹ 990.00

Introduction to Mechanics
(Second Edition)

Mahendra Verma
Professor, Department of Physics, Indian Institute of Technology Kanpur, India



Online resources available

This book offers a modern introduction to Newtonian dynamics and the basics of special relativity. It preserves the emphasis laid on the fundamental principles of mechanics and introduction of modern topics (as in the earlier edition), such as symmetries, nonlinear dynamics and presentation of Newton's laws as a differential equation.

The programming language Python is used to solve a large number of differential equations numerically and to plot them. Discussions on several topics have been expanded and many new topics have been introduced—surface tension and capillary action, Buckingham Pi theorem, impulse, magnetorotational instability (MRI), fluid flows and bending moment. The dynamics of the gyroscope have been developed very systematically and this is a unique feature of the book. Each chapter contains new illustrations, more discussions, examples and exercises.

Online resources available at:
www.universitiespress.com/mverma/itm

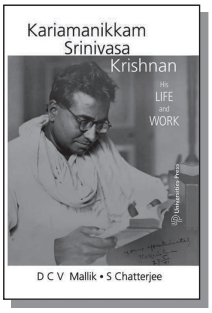
Content: *Preface to the Second Edition* ◆ *Preface to the First Edition* ◆ *Notation* ◆ History of Mechanics ◆ Newton's Laws of Motion ◆ Forces ◆ Kinematics vs Dynamics ◆ Motion on one Dimension ◆ Numerical Solution of Newton's Equations ◆ Phase Space Description of Mechanical Systems ◆ Symmetry Properties of Newton's Equation ◆ Two-dimensional Motion; Central Force Problem ◆ Three-dimensional Motion ◆ Energy ◆ Motion in a Noninertial Reference Frame ◆ Conservation of Linear Momentum and Centre of Mass ◆ Collisions ◆ Rotation Dynamics: Definitions ◆ Rigid Body Dynamics ◆ Nonlinear Dynamics And Chaos ◆ Statics ◆ Mechanics of Solids ◆ Mechanics of Fluids ◆ Special Theory of Relativity: Kinematics ◆ Relativistic Dynamics ◆ Epilogue ◆ Appendix A: Present Paradigm of Physics and Science ◆ Appendix B: Dimensional Analysis and Estimation ◆ Appendix C: Python Programming Language ◆ Appendix D: Matlab, Scilab and Octave ◆ Appendix E: Tensors and Moment of Inertia Tensor ◆ Appendix F: Vector Operations on Vector And Scalar Fields ◆ Appendix G: Important Astronomical Data ◆ Appendix H: Important Physical Constants ◆ Appendix I: Hyperbolic Functions ◆ Appendix J: Torque-free Precession Revisited ◆ *Answers to Selected Exercises* ◆ *Selected References* ◆ *Index*

2016	624 pp.	Paperback
978–81–7371–981–3		₹ 1,095.00

Kariamanikkam Srinivasa Krishnan: His Life and Work

D C V Mallik
Formerly Professor, Indian Institute of Astrophysics, Bengaluru, India

S Chatterjee
Professor, Indian Institute of Astrophysics, Bengaluru, India



The first four decades of the 20th century were glorious years for science, especially physics. Our view of the physical world changed forever with the emergence of quantum mechanics and Einstein's formulation of the theory of relativity. India too contributed significantly to this scientific revolution with the discoveries made by S N Bose, C V Raman and M N Saha, all in the space of about a decade. *Kariamanikkam Srinivasa Krishnan (1898-1961)* belonged to the same illustrious group. He was perhaps the only Indian physicist of his generation who was equally adept in theory and experiment. Besides a life of excellence in science, Krishnan's destiny led him to be an able science policy maker and administrator. *He was also a great teacher, a humanist and a scholar of Sanskrit, Tamil literature and philosophy.*

This biography, besides being a detailed and meticulously documented account of Krishnan's life and his scientific work, is also an *exciting account of the history of Indian science of the period. The source material of this work, most of which are being used for the first time, comes from the private papers of K S Krishnan that had remained in the custody of his family.*

Contents: Foreword ◆ Acknowledgement ◆ Prologue ◆ Background ◆ Childhood and Schooling ◆ College Years ◆ Science Education and Its Beginnings in Calcutta ◆ Calcutta ◆ Scattering of Light ◆ Discovery of the Raman Effect ◆ Dacca ◆ Bonds of Magnetism I: The Dacca Phase ◆ Winds of Change ◆ Bonds of Magnetism II: The Calcutta Phase ◆ Graphite and Its anomalous Diamagnetism ◆ Honours and Offers ◆ The Physics Chair at Allahabad ◆ Rejuvenating Physics in Allahabad ◆ The Widening Vista ◆ Krishnan in Delhi ◆ NPL: The Initial Years ◆ Oscillating Lattices, Emitting Surfaces, Heated Tubes ◆ The Broader Stage ◆ Into the Twilight ◆ *Appendix* ◆ *Primary Sources* ◆ *Bibliography* ◆ *Index*

2012	**516 pp.**	**Hardback**
978–81–7371–748–2		**₹ 2,040.00**
2011	**516 pp.**	**Paperback**
978–81–7371–749–9		**₹ 1,560.00**

Mathematical Methods of Classical & Quantum Physics

Tulsi Dass & Satish K Sharma

The book is intended to provide an adequate background for various theoretical physics courses, especially those in classical mechanics, electrodynamics, quantum mechanics and statistical physics. Each topic is dealt with in a generally self-contained manner and the text is interspersed with a number of solved examples and a large number of exercise problems.

Contents: *Preface* ◆ *Acknowledgements* ◆ Vector analysis ◆ Matrices and Linear Vector Spaces ◆ Tensors ◆ Complex Variables ◆ Ordinary Differential Equations ◆ Special Functions ◆ Calculus of Variations ◆ Function Spaces, Orthogonal Expansions and Strum-Liouville Theory ◆ Integral Transforms: Generalized Functions ◆ Partial Differential Equations ◆ Green's Functions ◆ Probability and Statistics ◆ Elements of Group Theory ◆ *Appendix* ◆ *References* ◆ *Index*

1998	**716 pp.**	**Paperback**
978–81–7371–089–6		**₹ 1,050.00**

Mathematical Physics: Advanced Topics

SD Joglekar
Professor of Physics, Indian Institute of Technology Kanpur, Kanpur, India

This is the companion volume to *Mathematical Physics: The Basics*, which covers topics like vectors, tensors, Cartesian coordinates, Lorentz tensors, curvilinear coordinates, linear vector spaces, linear operators, matrices, complex variables and their applications. It covers more advanced topics taught in the second/third semester which include ODE, gamma and beta functions, Bessel functions, spherical harmonics and special functions, partial differential equations, generalised functions, and group theory. *Together, the two volumes cover the subject of mathematical physics for a PG course in physical sciences.*

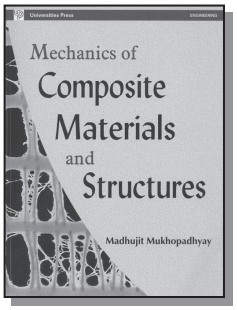
Contents: *Preface* ◆ Ordinary Differential Equations ◆ Gamma (Factorial) and Beta Functions ◆ Bessel Functions ◆ Some Special Functions and Spherical Harmonics ◆ Partial Differential Equations ◆ Generalized Functions, the Dirac Delta Function and the Fourier Transform ◆ Group Theory ◆ *Appendix* ◆ *References* ◆ *Index*

Distributed worldwide by CRC Press LLC, USA, Taylor and Francis Group, except in India, Pakistan, Bangladesh, Sri Lanka, Nepal and Bhutan.

2006	**264 pp.**	**Paperback**
978–81–7371–560–0		**₹ 695.00**

Mechanics of Composite Materials and Structures

Madhujit Mukhopadhyay
Formerly Professor, Department of Ocean Engineering and Naval Architecture, Indian Institute of Technology Kharagpur, Kharagpur, India



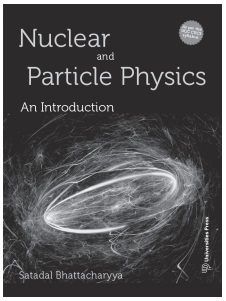
Fibre reinforced plastic (FRP) materials have a wide range of applications in various engineering structures - offshore, maritime, aerospace and civil engineering; machine components; chemical engineering applications and so on. The scope for intelligent exploitation of these composites is ample, though the actual use has been limited. This is mainly because of the paucity of adequate knowledge on FRP composite materials, its structural mechanics and structural analysis among practising engineers. *Mechanics of Composite Materials and Structures* is an attempt to present an integrated and unified approach to the analysis of FRP composite materials. The micromechanics and lamination theory of composite structural elements are discussed in detail. Closed form analytical solutions as well as numerical techniques for solving problems in FRP analysis are presented. Applications of the finite element method for the analysis of FRP structural elements are given considerable emphasis.

Contents: *Preface* ◆ Introduction to Composite Materials ◆ Processing of FRP Composites ◆ Micromechanical Analysis of Composite Strength and Stiffness ◆ Elastic Properties of the Unidirectional Lamina ◆ Analysis of Laminated Composites ◆ Analytical Methods of Laminated Plate ◆ Analysis of Composite Beams ◆ Finite Element Analysis of Composite Structures ◆ Hydrothermal Effects in Laminates ◆ Failure Theories and Strength of a Unidirectional Lamina ◆ Analysis of Laminate Strength ◆ Design of Fiber Reinforced Composite Structures ◆ Composite Joints ◆ *Index*

2004	**388 pp.**	**Paperback**
978-81-7371-477-1		**₹ 1,110.00**

Nuclear and Particle Physics: An Introduction

Satadal Bhattacharyya
Associate Professor of Physics, Scottish Church College, Kolkata



Online resources available

This book is intended primarily for BSc Honours and General students pursuing Physics in various Indian universities. It provides complete and comprehensive coverage of Nuclear and Particle Physics as specified by the new Choice-Based Credit System (CBCS) syllabus. Topics include the properties of nuclei, different nuclear models, radioactive decay, nuclear reactions, interaction of radiation with matter, nuclear astrophysics, particle physics and particle accelerators.

While there is strong emphasis on following an exam-oriented approach, equal importance has been given to ensure that students have a thorough grasp of the subject and are actively engaged in the learning process.

Salient Features:

- Includes the fundamentals of many advanced topics (useful for undergraduates) such as intrinsic parity, parity violation in weak interaction, and non-relativistic and relativistic nuclear collisions.
- Contains more than 180 illustrative examples with step-by-step solutions at the end of each topic for easy assimilation of the concepts learnt.
- Incorporates different types of problems – solved, with hints, assignments to assess

comprehension, plotting of graphs using GNUPLOT – that may help readers develop an overall understanding of the subject while preparing for university examinations.
- Provides more than 270 review questions, including 100 MCQs, to help students excel in competitive examinations such as NET and GATE.

Online resources available at: www.universitiespress.com/nuclearandparticlephysics

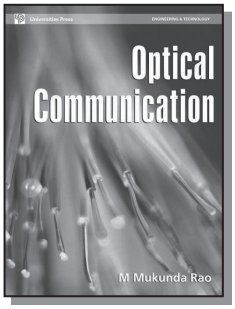
For Teachers: Solutions manual and chapter-wise PowerPoint slides.

Contents: *Preface* ◆ **Properties of Nuclei** ◆ Constituents of the Nucleus ◆ Nuclear Size ◆ Atomic Mass ◆ Density of the Nucleus ◆ Binding Energy ◆ Spin and Parity ◆ Electric and Magnetic Moments ◆ Properties of Nuclear Force ◆ **Nuclear Model** ◆ Liquid-Drop Model of the Nucleus ◆ Nuclear Shell Model ◆ Nuclear Fermi Gas Model ◆ **Radioactivity** ◆ Radioactive Decay Equation ◆ Alpha Decay ◆ Beta Decay ◆ Gamma Decay ◆ **Nuclear Reactions** ◆ Nuclear Reactions and Conservation Laws ◆ Energetics of Nuclear Reactions ◆ Fission ◆ Fusion ◆ **Interaction of Nuclear Radiation with Matter** ◆ Energy Transfer in Elastic Collision ◆ Interaction of Heavy Charged Particles with Matter ◆ Interaction of Electrons with Matter ◆ Range of Charged Particles ◆ Interaction of Photons with Matter ◆ Detection of Nuclear Radiation ◆ Scintillation Detector ◆ **Particle Accelerators** ◆ Need for Higher Energy ◆ Linear Accelerator (LINAC) ◆ Cyclotron ◆ Phase Stability and the Principle of Synchrocyclotron ◆ Betatron: Principle of Operation ◆ **Particle Physics** ◆ Fundamental Interactions ◆ Elementary Particles ◆ Conservation Laws ◆ The Eightfold Way and the Quark Model ◆ **Nuclear Astrophysics** ◆ Expanding Universe ◆ Cosmic Microwave Background Radiation ◆ First Few Seconds after the Big Bang ◆ Stellar Nucleosynthesis ◆ *Appendix A:* Penetration of Rectangular Barrier ◆ *Appendix B:* Parity ◆ *Appendix C:* List of Physical Constants ◆ *Bibliography* ◆ *Index*

2020	**344 pp.**	**Paperback**
978–93–89211–15–3		**₹ 635.00**

Optical Communication

M Mukunda Rao
Research Professor, Biomedical Sciences, Ramachandra Medical College and Research Institute, Chennai, India



This book deals with optical electronics and communication, and is intended as a core textbook for use both at the undergraduate and postgraduate levels in engineering colleges. The author discusses a number of important aspects like optical sources, transmission mediums, optical fibres, photodetectors, optical receivers, and modulation and remodulation systems. Each concept is systematically presented starting with the historical background and subsequent developments.

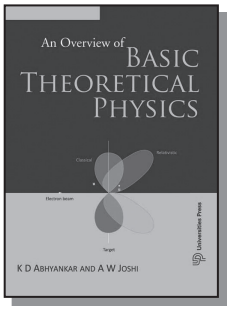
Contents: *Preface* ◆ *Introduction* ◆ Optical Sources: The LASER ◆ Optical Sources: The Semiconductors Laser Diode and Light Emitting Diode ◆ Transmission Medium: Atmospheric Propagation ◆ Transmission Medium: Fiber Optics ◆ Optical Fiber Characterization and Fabrication ◆ Photodetectors and Optical Receivers ◆ Modulation and Demodulation Schemes in Optical Communication ◆ Optical Communication Systems ◆ *Bibliography* ◆ *Physical Constants* ◆ *Index*

2000	**208 pp.**	**Paperback**
978–81–7371–090–2		**₹ 655.00**

Overview of Basic Theoretical Physics, An

K D Abhyankar (Late)
Former chairman, Department of Astronomy, Osmania University, Hyderabad. Former Director of Nizamiah and Japal–Rangapur Observatories

A W Joshi
Professor (Retd), University of Pune, Pune



This book covers both the pre-quantum and post-quantum development of theoretical physics in a straightforward but fairly rigorous style. Unlike most modern physics courses which gloss over the basic physic subjects in preference to specialised topics like solid state physics, electronics, plasma physics, nanotechnology, cosmology, astrophysics and computer science, this book brings together the various branches of theoretical physics on one platform to give a panoramic view of the subject. The first four chapters of the book deal with the classical topics of Hamiltonian mechanics, theories of relativity, electromagnetic theory of radiation and thermodynamics. They are followed by chapters on atomic spectra and quantum mechanics, spectra of diatomic molecules, quantum theory of radiation, statistical mechanics, and nuclear and particle physics. Guided exercises form a unique feature of this book.

The broad coverage of topics in theoretical physics makes this book an invaluable reference for senior undergraduate and postgraduate students of all branches of physics as well as research workers and physics teachers. The book will also serve for a foundation course for allied subjects such as astrophysics, geophysics, meteorology, laser physics and plasma physics.

Contents: Hamiltonian Mechanics ◆ Introduction ◆ System of n particles in Cartesian coordinates ◆ Generalised quantities ◆ Validity of Lagrangian and Hamiltonian equations in generalized coordinates ◆ Principle of least action ◆ Poisson brackets ◆ Contact transformation ◆ Hamilton-Jacobi equation ◆ Some applications of Hamilton-Jacobi equations ◆ The two-body problem ◆ Virial theorem ◆ Problems ◆ **Special and General Theories of Relativity** ◆ Background ◆ Lorentz transformations ◆ Generalised Lorentz transformations ◆ Kinematic applications ◆ Minkowski space ◆ Relativistic mechanics ◆ Elements of general theory of relativity ◆ Gravitational lensing ◆ Problems ◆ **Classical Theory of Radiation** ◆ Maxwell's equations ◆ Electromagnetic waves ◆ Electromagnetic radiation by a molecule ◆ Harmonic oscillator ◆ Properties of transmitting medium ◆ Relativistic transformation of electromagnetic fields ◆ Electrodynamics of moving charges ◆ Scattering of small particles ◆ *Appendix* ◆ Problems ◆ **Thermodynamics** ◆ Definitions ◆ Equation of state ◆ Changes in thermodynamic systems ◆ First law of thermodynamics ◆ Specific heats ◆ Second law of thermodynamics ◆ Absolute temperature ◆ Entropy ◆ The phase rule ◆ Important thermodynamic functions ◆ Theorem of radiation ◆ Spectrum of thermal radiation ◆ Problems ◆ **Atomic Spectra and Quantum Mechanics** ◆ Bohr's theory of hydrogen atom ◆ Sommerfeld's modification of Bohr's theory ◆ Fundamentals of quantum mechanics ◆ One-dimensional motion ◆ Hydrogen and hydrogen-like atoms in quantum mechanics ◆ Electron spin ◆ Effect of spin in other atoms ◆ Zeeman and Stark effects ◆ Problems ◆ **Molecular Spectra** ◆ Introduction ◆ Pure rotational bands ◆ Vibration-rotation bands ◆ Electronic bands ◆ Multiplet structure of electronic states ◆ Isotope effects ◆ Strengths of bands and lines ◆ Some typical examples of molecular spectra ◆ Problems ◆ **Quantum Theory of Radiation** ◆ Quantization of pure radiation ◆ Radiation and matter ◆ First order approximation for transition ◆ Computation of transition probabilities ◆ Absorption, emission, and Einstein coefficients ◆ Weisskopf.-Wigner picture ◆ Problems ◆ **Statistical Mechanics** ◆ Kinetic theory of gases ◆ Fundamentals of statistical mechanics ◆ Expression for probability ◆ Population functions ◆ Equation of state for fermions ◆ Some aspects of Bose gas ◆ Classical non-degenerate state ◆ Departure from thermodynamic equilibrium ◆ Problems ◆ **Elements of Nuclear and Particle Physics** ◆ Discovery of the nucleus ◆ Structure of the nucleus ◆ Nuclear reactions and liquid-drop model of nucleus ◆ Elements of particle physics ◆ Applications in astrophysics ◆ Problems ◆ *Bibliography* ◆ *Index*

2009	512 pp.	Paperback
978–81–7371–655–3		₹ 1,260.00

Physics of Semiconductor Devices
(Second Edition)

Dilip K Roy
Institute of PG Studies and Research, University of Malaya, Malaysia

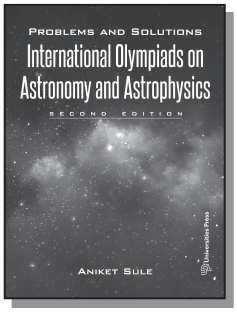
This book is a comprehensive and up-to-date text providing a lucid perspective of the important concepts and applications of semiconductor devices. It discusses the quantum mechanical tunnel effect on the principles of quantum measurement and observations, and its application in the analysis of *I–V* characteristics of tunnel devices. In this edition, the basic outline of the book and its underlying philosophy remain unchanged. The discussions on 'quantum mechanical tunnelling' have been updated. *Most of the problems in the first edition have been retained and a large number of problems have been added, both as solved examples and as unsolved exercises.* It also contains appendices on amorphous semiconductors and the technology involved in the preparation of semiconductor devices.

Contents: *Preface to the Second Edition* ◆ *Preface* ◆ *Acknowledgements* ◆ *List of Symbols* ◆ Semiconductor Physics: Energy bands ◆ Electrons and holes ◆ Mobility and diffusivity ◆ Intrinsic semiconductor ◆ Doped semiconductor ◆ Temperature dependence of the semiconductor conductivity ◆ Carrier lifetime ◆ Recombination of electrons and holes through traps ◆ Shockely-Read-Hall theory ◆ Optical properties of semiconductors ◆ Gunn effect ◆ Low dimensional quantum phenomena ◆ Physics of PN Junctions: PN homojunctions ◆ Semiconductor heterojunctions ◆ PN Diode equation ◆ A. C. behaviour of PN diodes ◆ Transient response of a PN diode ◆ Solar cells ◆ Light emitting diodes (LEDs) ◆ Laser diodes ◆ Impact avalanche and transit time (IMPATT) diodes ◆ Other configuration of PN diodes ◆ Circuit applications of PN diodes ◆ Transistors Physics: Basic functions of a transistor ◆ Early effect and transistor characteristics ◆ Low-frequency transistor equivalent circuiting ◆ High-frequency transistor behaviour ◆ Graded base transistors ◆ Field-effect transistors ◆ Phototransistor ◆ Unijunction transistor ◆ The four layer PN device ◆ Typical transistor application applications ◆ Metal-semiconductor Devices: Metal-vacuum boundary ◆ Schottky effect ◆ Metal-semiconductor boundary ◆ Ohmic contact ◆ Current transport across a metal-semiconductor boundary ◆ Metal-insulator-semiconductor (MIS) system ◆ Metal-semiconductor field-effect transistor (MESFET) ◆ Metal-oxide-semiconductor field-effect transistor (MOSFET) ◆ Charge coupled devices (CCDs) ◆ Semiconductor Tunnel Devices: Tunnelling from the point of view of quantum measurement ◆ Analysis of the tunnel effect ◆ Heavy-doping effects ◆ Tunnel diodes; Backward and Zener diodes ◆ Metal-insulator-semiconductor-switch (MISS) diode ◆ Tunnel devices of different types ◆ Tunnel diode application ◆ *Appendices* ◆ *Index*

2004 **488 pp.** **Paperback**
978–81–7371–494–8 **₹ 975.00**

Problems and Solutions: International Olympiads on Astronomy and Astrophysics

Aniket Sule
Academic Coordinator, Indian Astronomy Olympiad Programme; Regional Coordinator (Asia–Pacific), International Olympiads on Astronomy and Astrophysics; Reader, Homi Bhabha Centre for Science Education, Tata Institute of Fundamental Research, Mumbai, India



The International Olympiads on Astronomy and Astrophysics (IOAA) are competitions where teams of high-school students from around the world compete in a series of tests and are awarded medals based on their performance. Started in 2007, more than 45 countries have participated in these olympiads. The competition comprises three rounds: theoretical problems, data analysis problems and night sky observation tests. This book presents problems from all the eight IOAAs held thus far. The problems are categorised according to the concepts involved and also graded according to the difficulty level. Solutions to all the problems are provided. Additional notes help make the solutions self-explanatory.

Salient Features:

- Presents problems and solutions from all eight olympiads held thus far
- Problems arranged based on topic and level of difficulty
- Non-calculus based approach, making it accessible to high-school students
- Numerical values use the SI system of units wherever applicable
- For problems with multiple solutions, all the solutions are provided
- Includes current syllabus of IOAA

Contents: *Preface* ◆ *Acknowledgments* ◆ *Academic Committees of Previous IOAAs* ◆ *President's Message* ◆ *A Note about the Problems* ◆ *Table of Constants* ◆ Celestial Mechanics ◆ Celestial Coordinate Systems ◆ Geometric Astronomy and Time ◆ Optics and Detectors ◆ Physics of Stars and Planets ◆ Stellar Observations ◆ Binaries and Variables ◆ Galactic Astrophysics ◆ Extragalactic Astrophysics ◆ Night Sky Observation ◆ Solutions: Celestial Mechanics ◆ Solutions: Celestial Coordinate Systems ◆ Solutions: Geometric Astronomy and Time ◆ Solutions: Optics and Detectors ◆ Solutions: Physics of Stars and Planets ◆ Solutions: Stellar Observations ◆ Solutions: Binaries and Variables ◆ Solutions: Galactic Astrophysics ◆ Solutions: Extragalactic Astrophysics ◆ Solutions: Night Sky Observation ◆ *Appendix: Syllabus of IOAA*

2015	304 pp.	Paperback
978–81–7371–980–6		₹ 975.00

Quantum Mechanics

Trilochan Pradhan
Founding Director and Honorary Professor Emeritus, Institute of Physics, Bhubaneswar

This book presents a novel treatment of some unusual topics of non-relativistic theory of quantum mechanics, not often covered in classic texts. Notable among these are the first quantized theory of photons and neutrons (most books give the second quantized theory); Bohr–Sommerfeld 'action' as differential operators with their eigenvalues *n* and *l* and their corresponding eigenfunctions; parabose and parafermi symmetries of identical particles; Dirac's initiation of Lagrangian formulation of quantum mechanics (also known as transformation theory) and its elaboration and completion by Feynman; topological phase of the wavefunction in Bohm–Aharonov, Aharonov–Casher and neutron interferometer experiments (examples of the Berry phase); and quantum beats such as Stark and exchange oscillations similar to $^{-}\kappa\kappa_0$ and neutrino oscillations in particle physics.

Graduate students of physics will find this fresh exposition of topics interesting as also will teachers of physics. The book is intended to broaden one's understanding of quantum mechanics. This is a reference book that most physics departments at universities would like to procure.

Contents: *Preface* ◆ Genesis ◆ Foundations ◆ Symmetry and Conservation Laws ◆ Energy, Momentum and Angular Momentum ◆ Quantum Mechanics of Photon and Neutrino ◆ Passage from Quantum to Classical Mechanics ◆ Solution of Schrödinger Equation ◆ The Hydrogen Atom ◆ Perturbation Theory ◆ Electron Spin and Hydrogen Fine Structure ◆ Identical Particles ◆ The Helium Atom ◆ Emission and Absorption of Photons by Atoms ◆ Scattering of Photons by Atoms ◆ Lamb Shift ◆ Theory of Scattering ◆ Phase of the Wavefunction ◆ Lagrangian Formulation of Quantum Mechanics ◆ Paradoxes in Quantum Mechanics ◆ *Appendix-A* ◆ *Appendix-B* ◆ *Subject Index* ◆ *Author Index*

2008	252 pp.	Paperback
978–81–7371–624–9		₹ 925.00

Second Year Calculus: From Celestial Mechanics to Special Relativity

David M Bressoud

Second Year Calculus: From Celestial Mechanics to Special Relativity covers multi-variable and vector calculus, emphasizing the historical physical problems which gave rise to the concepts of calculus. The book guides us from the birth of the mechanized view of the world in *Isaac Newton's Mathematical Principles of Natural Philosophy* in which mathematics becomes the ultimate tool for modelling physical reality, to the dawn of a radically new and often counter-intuitive age in *Albert Einstein's Special Theory of Relativity* in which it is the mathematical model which suggests new aspects of that reality. The development of this process is discussed from the modern viewpoint of differential forms. Using this concept, the student learns to compute orbits and rocket trajectories, model flows and force fields, and derive the laws

of electricity and magnetism. *These exercises and observations of mathematical symmetry enable the student to better understand the interaction of physics and mathematics.*

Contents: F = ma ◆ Vector Algebra ◆ Celestial Mathematics ◆ Differential Forms ◆ Line Integrals, Multiple Integrals ◆ Linear Transformations ◆ Differential Calculus ◆ Integration by Pullback ◆ Techniques of Differential Calculus ◆ The Fundamental Theorem ◆ $E=mc^2$

2010	**416 pp.**	**Paperback**
978-81-8489-622-0		**₹ 1,110.00**

Statistical Mechanics: An Elementary Outline

(Revised Edition)

Avijit Lahiri
Formerly Associate Professor, Vidyasagar Evening College, Kolkata, India

The revised edition of *'Statistical Mechanics: An Elementary Outline'* is a novel experiment in the pedagogy of statistical mechanics, wherein the reader is made familiar with the basic concepts relating to the foundations of the subject and, at the same time, gets to know how the practical derivations are worked out in elementary applications. The material is arranged so that the reader can decide which of the two to focus upon, perhaps relegating the latter to a cursory attention in the first reading. The book includes a small number of well-chosen exercises of a heuristic nature, designed to enable the reader to undertake with confidence and initiative the next higher course on the subject. Some of the problems are challenging, like the problem on the anharmonic correction to the equipartition of energy. A number of new topics are introduced in this edition to make the material more complete and solidly founded.

Contents: *Preface to the First Revised Edition* ◆ *Preface to the First Edition* ◆ Introduction: Getting Launched from Classical Mechanics: A Preview of Statistical Mechanics ◆ Quantum Mechanics: Elementary Notions ◆ Quantum Mechanics: Illustrations; Statistical Mechanics: The First Fundamental Postulate ◆ The Entropy Postulate; The Programme of Equilibrium Statistical Mechanics ◆ *Appendix to Chapter 1:* More on the Fundamental Postulates ◆ The Microcanonical Ensemble and its Applications: Stirling's Approximation; System of Non-Interacting Spins ◆ Einstein's Theory of Crystalline Specific Heat ◆ Systems of Identical Particles; State Counting for Bosons and Fermions; The Ideal Gas ◆ The Classical Ideal Gas: Semiclassical State Counting ◆ The Canonical and the Grand Canonical Ensembles: Introducing the Canonical Ensemble ◆ Probability Distribution in the Canonical Ensemble ◆ Thermodynamic Quantities in the Canonical Ensemble ◆ Energy Dispersion in the Canonical Ensemble ◆ Statistical Mechanics of Large System: Recapitulation ◆ The Grand Canonical Ensemble: Introduction ◆ Probability Distribution in the Grand Canonical Ensemble ◆ Thermodynamic Functions in the Grand Canonical Ensemble ◆ Entropy as 'Disorder' ◆ Evolution Towards Maximal Disorder; *Appendices to Chapter 3:* Statistical Mechanics: Simple Applications: A Single Harmonic Oscillator at Temperature T ◆ A System of Distinct Non-Interacting Constituents at Temperatures T ◆ Semiclassical Statistical Mechanics in the Canonical Ensemble and Applications ◆ The Vibrating Lattice: Specific Heat at Low Temperatures ◆ Black Body Radiation: Plank's Formula ◆ Paramagnetic Susceptibility ◆ Ideal Fermi and Bose Gases in the Grand Canonical Ensemble ◆ Quantum Virial Expansion for the Ideal Gas ◆ The 'Electron Gas' in a Conductor ◆ Bose Condensation ◆ Ferromagnetic Behaviour and the Using Model ◆ Gas with Weakly Interacting Molecules: Deviation from Ideality ◆ *References* ◆ *Index*

Available in print and e-book formats.
For details, visit www.universitiespress.com.

2008	**290 pp.**	**Paperback**
978-81-7371-614-0		**₹ 835.00**

Textbook of Nanoscience and Nanotechnology

B S Murty
Professor, Department of Metallurgical and Materials Engineering, Indian Institute of Technology Madras, Chennai, India

P Shankar
Principal, Saveetha School of Engineering, Saveetha University, Chennai, India

Baldev Raj
Director, National institute of Advanced Studies, Indian Institute of Science Campus, Bengaluru, India

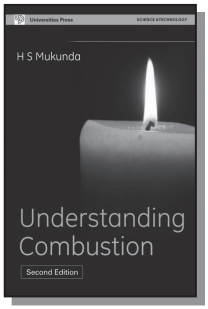
B B Rath
Director, Materials Science and Component Technology, Naval Research Laboratory, Washington DC, USA

James Murday
Naval Research Laboratory, Washington DC, USA

See page 29

Understanding Combustion
(Second Edition)

H S Mukunda
Group Leader, Combustion, Gasification and Propulsion Laboratory (CGPL), Department of Aerospace Engineering, Indian Institute of Science, Bengaluru, India



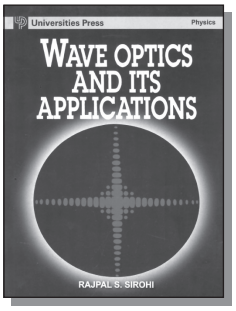
The phenomenon of combustion, seemingly so simple and present almost in all spheres of our lives, is a fascinatingly complex process that involves elements of chemistry, thermodynamics, and fluid mechanics. In *Understanding Combustion*, the author takes on the task of revealing its myriad aspects for the benefit of a general reader with a background in science. The narrative introduces the reader to the process of combustion happening everywhere, in the domestic, industrial and scientific spheres and then goes on to explain the aspects of engineering design involved in the control of the process. From a simple candle flame to cooking stoves to combustion in hybrid rocket engines, the book looks at combustion in varied fuel media, examines the chemistry behind it, analyses the stability of the process and the modelling of combustion devices. *In this revised edition, three new chapters on gasification of solid fuels, emission of pollutants and explosion and detonation have been included to expand the field of discourse to recent developments and also cover practical issues related to conservation of fuels and environmental degradation.* This book would be of interest to students of science and technology.

Contents: *Preface to the Second Edition* ◆ *Preface to the First Edition* ◆ *Symbols* ◆ Why should One Attempt to Understand Combustion? ◆ What Do We Burn and Why? ◆ Chemistry and Stoichiometry ◆ How Much Heat? How High a Temperature? ◆ How Does a Reaction Proceed? At What Rate? ◆ Premixed Flames ◆ Inflammability, Quenching ◆ Ignition ◆ Stability, Extinction and Blow-Off of Flames ◆ Diffusion Flames-Gaseous Burner Flames, Droplet Combustion, Boundary Layer Combustion ◆ Flames-Premixed or Diffusion ◆ Combustion in Rocket ◆ Stoves, Burners, Combustors and Their Efficiency ◆ Fire Spread and Fire Prevention ◆ Solid Fuels: Combustion and Gasification ◆ Emissions from Combustion Systems ◆ Explosives - Solid and Liquid ◆ Is There More to Understand? ◆ *Further Reading*

2009	184 pp.	Paperback
978–81–7371–685–0		₹ 870.00

Wave Optics and its Application

S Sirohi Rajpal
Professor of Eminence, Department of Physics, Tezpur University, Assam



With the advent of lasers, microcomputers and electronic detectors, the domain of optics has expanded enormously, and its applications have penetrated almost all areas of science, engineeringand technology.

This book discusses some phenomena exhibited by waves. The early chapters analyse the electromagnetic nature of light, the properties of light waves, such as coherence, the applications of interference to length metrology and optical testing and the role of diffraction in image-forming and

spectroscopic instruments. Further chapters take a closer look at phenomena such as interference, diffraction and holography on the basis of scalar theory. A chapter on coherent optics discusses the basics of optical data processing. Holography and speckle phenomenon as well as their applications are discussed in a separate chapter. The final chapter on metrology deals with the measurement of commonly encountered parameters with the help of laser-based instruments.

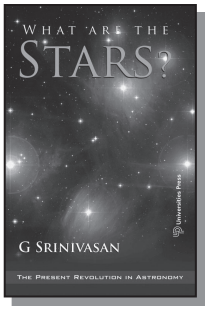
The book will serve as a comprehensive text covering applied optics and optical instrumentation for B.Tech. and M.Sc. students. It will also serve as a useful rererence book for research scholars and engineers working in the area of optics.

2013	**420 pp.**	**Paperback**
978–81–7371–909–7		**₹ 950.00**

What are the Stars?

PRINT ON DEMAND

G Srinivasan
Professor (Retd), Raman Research Institute, Bangalore



This is the first volume in the series '**The Present Revolution in Astronomy**' authored by G Srinivasan. The outstanding question in astronomy at the turn of the twentieth century was: what are the stars and why are they as they are? In this volume, the story of how the answer to this fundamental question was unravelled is narrated in an informal style, with emphasis on the underlying physics. It also gives an overview of the topics that will be covered in later volumes—white dwarfs, neutron stars, black holes, galaxies, and the universe at large.

I know of no comparable book in the present-day literature that so successfully conveys the excitement of the development of ideas pertaining to the physics of stars, including the newest discoveries, and at the same time explains the fundamentals so well.

E P J van den Heuvel
Professor of Astrophysics
University of Amsterdam, The Netherlands

Contents: *Foreword* ◆ *Preface* ◆ The Present Revolution in Astronomy: An Overview ◆ What Are the Stars? ◆ Stars as Globes of Gas ◆ Eddington's Theory of the Stars ◆ Why Are the Stars as They Are? ◆ Energy Generation in the Stars ◆ Sounds of the Sun ◆ The Smoking Gun is Finally Found ◆ *Epilogue* ◆ *Suggested Reading* ◆ *Index*

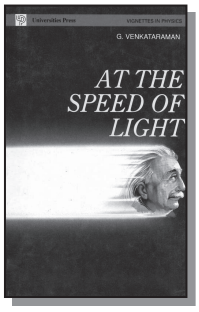
2011	**268 pp.**	**Paperback**
978–81–7371–741–3		**₹ 695.00**

Vignettes in Physics

This series, which is a sort of random walk in physics, is mainly intended to arouse the curiosity of the serious reader, besides capturing the drama and excitement of great discoveries.

At the Speed of Light

G Venkataraman

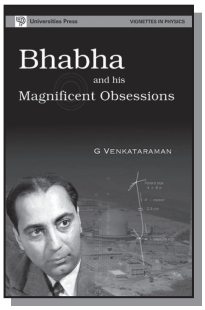


This book is about the Theory of Relativity. The story of Relativity is, in a sense, the story of one man—Albert Einstein. The book deals only with the Special Theory, which you will find is not very difficult to understand.

1992	**136 pp.**	**Paperback**
978–81–7371–009–4		**₹ 425.00**

Bhabha and His Magnificent Obsessions

G Venkataraman



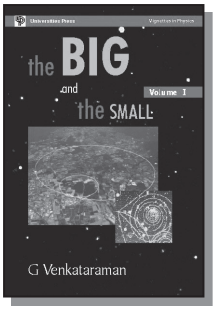
This book is about the remarkable scientist Homi Jehangir Bhabha who, at the age of eighteen, went to Cambridge to study physics and started his research career there. In 1939, when Bhabha came to India on a short vacation, he was forced to stay on as the Second World War broke out. This was, of course, a blessing for the country as he later steered the country's scientific destiny. The book records Bhabha's contributions which were in many dimensions and not just purely scientific.

Available in print and e-book formats.
For details, visit www.universitiespress.com.

1994	**224 pp.**	**Paperback**
978–81–7371–007–0		**₹ 575.00**

Big and the Small, The, Vol. 1: Journey into the Microcosm

G Venkataraman

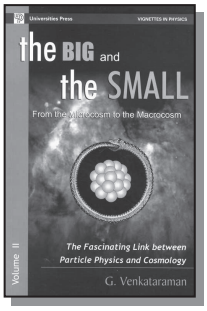


By probing deeper and deeper into the innermost recesses of the atom, physicists have been able to obtain not only a better understanding of the vast cosmos but indeed of the origin of the cosmos itself. This book is about the greatest adventure in human history—man's attempt to reconstruct Creation by a combination of the most daring flights of imagination and mind-boggling experiments. It is, in short, the study of high-energy physics which may aptly be called the second Creation, or man's attempt to reconstruct Creation.

2001	**284 pp.**	**Paperback**
978–81–7371–227–2		**₹ 730.00**

Big and the Small, The, Vol. 2: From the Microcosm to the Macrocosm: The Fascinating Link between Particle Physics and Cosmology

G Venkataraman

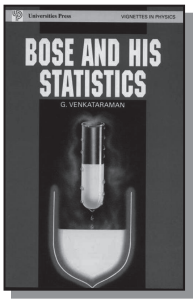


This book is the second part of the two-volume set entitled The Big and the Small. In the earlier volume, Journey into the Microcosm: the Story of Elementary Particles, the story of elementary particle physics was related. In the present volume the author describes how the physics of elementary particles allow us to reconstruct the origin of the universe and its subsequent evolution. Carrying on from the point where volume 1 was concluded, the story of the fascinating quest for the Ultimate Theory (the theory that stands all by itself and does not rest on any other pedestal) is revealed here in the context of the shortcomings of the Standard Model.

2006	**232 pp.**	**Paperback**
978–81–7371–574–7		**₹ 575.00**

Bose and His Statistics

G Venkataraman



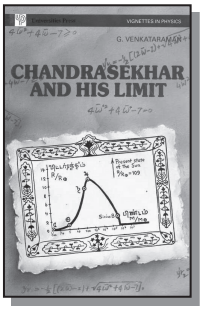
This book describes a monumental discovery made by Satyendranath Bose. It also helps the reader take a step closer in understanding Bose—the scientist—and describes the events that surround this exciting discovery.

Available in print and e-book formats.
For details, visit www.universitiespress.com.

1992	**136 pp.**	**Paperback**
978-81-7371-036-0		**₹ 395.00**

Chandrasekhar and His Limit

G Venkataraman



This is a heart-warming and very inspiring story about Subrahmanyam Chandrasekhar, the most distinguished mathematical physicist India has produced. In a long and remarkable career, Chandrasekhar has done many outstanding things but this book concentrates mostly on one of them, namely, the discovery of the Chandrasekhar Limit.

Available in print and e-book formats.
For details, visit www.universitiespress.com.

1992	**144 pp.**	**Paperback**
978-81-7371-035-3		**₹ 565.00**

Hot Story, A

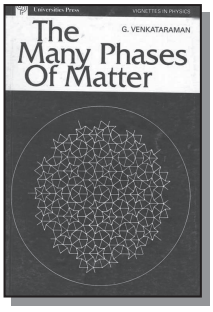
G Venkataraman

This book attempts to explain the terms heat and temperature. But instead of relying mainly on technical explanations that are highly mathematical, the author takes a look at what really lies behind these phenomena.

1992	**140 pp.**	**Paperback**
978-81-7371-010-0		**₹ 425.00**

Many Phases of Matter, The

G Venkataraman

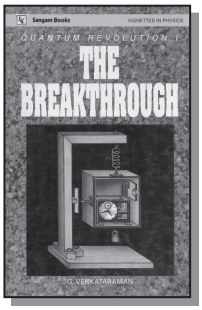


This book is about phase transitions. It seeks to unfold the universal connecting link between diverse physical phenomena, all involving a change of state.

1991	**104 pp.**	**Paperback**
978-81-7371-034-6		**₹ 425.00**

Quantum Revolution I—The Breakthrough

G Venkataraman

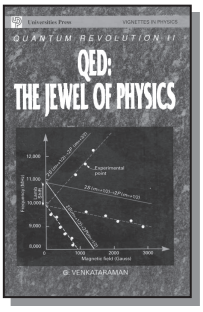


The discovery of quantum mechanics is often hailed as the greatest revolution in human thought. This volume, the first in a series of three, seeks to capture the drama of this supreme achievement.

1993	**200 pp.**	**Paperback**
978–81–7371–002–5		**₹ 425.00**

Quantum Revolution II—The Jewel of Physics

G Venkataraman

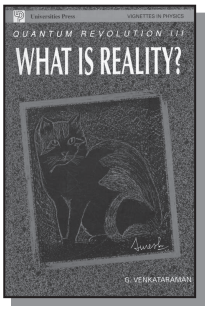


This volume describes how the battle of infinities was fought and, more importantly, about a new approach to quantum mechanics. It deals with the birth of quantum electrodynamics, a theory of incredible and unmatched precision and the most perfect physical theory known to man.

1993	**144 pp.**	**Paperback**
978–81–7371–003–2		**₹ 425.00**

Quantum Revolution III—What is Reality?

G Venkataraman

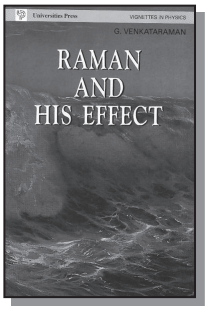


This concluding part of the trilogy on quantum mechanics deals with the fascinating question: Is there really a world out there or does it exist because we see it?

1993	**140 pp.**	**Paperback**
978–81–7371–004–9		**₹ 425.00**

Raman and His Effect

G Venkataraman

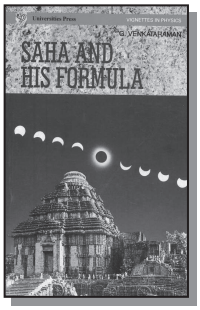


This book deals with the famous Scattering Effect discovered by Sir C V Raman. It gives us deep insights into the character of this famous scientist and vividly describes the circumstances surrounding the discovery.

1995	**108 pp.**	**Paperback**
978–81–7371–008–7		**₹ 425.00**

Saha and His Formula

G Venkataraman



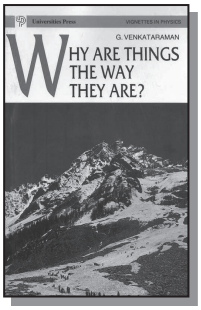
A great leap forward in unravelling the mysteries of the Sun occurred way back in 1920 when Meghnad Saha made an important discovery that paved the way for a systematic study of stellar atmospheres in general. This book is about that great discovery and the man who made it.

Available in print and e-book formats.
For details, visit www.universitiespress.com.

1995	**206 pp.**	**Paperback**
978–81–7371–017–9		**₹ 425.00**

Why are Things the Way they are?

G Venkataraman



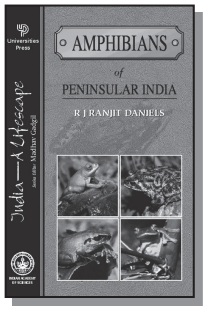
This book uses basic calculations to help the student answer questions such as, "Why is the size of an atom roughly 10–8cm and not 1cm?" or "Why is the height of Mount Everest 10 km and not 100 km?" In short, "Why are things the way they are?" This book is an introduction to some methods of making rapid estimates, and shows how estimated answers can be made in just a few steps.

1992	**120 pp.**	**Paperback**
978–81–7371–033–9		**₹ 425.00**

Wildlife and Natural History

Amphibians of Peninsular India

R J Ranjit Daniels
Founder and Director, Care Earth



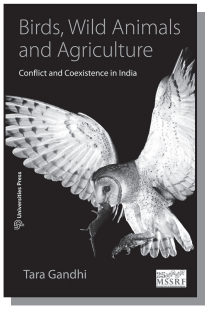
Amphibians are considered to be the best indicators of environmental health. A decline in amphibian populations indicates ecosystem deterioration that might affect a wider spectrum of the earth's biological diversity. During the last 12 years there has been a great concern, worldwide, about the rapid decline in amphibian populations. Many reasons have been attributed to the loss of amphibians including habitat loss, UV-B radiation, global warming, toxic chemicals, pathogens that destroy eggs and larval stages, direct harvest and other. Of these, loss of habitat seems to be the most significant factor, at least in tropical countries. In this book, 72 species of Indian amphibians including caecilians have been described. These amphibians are common and widely distributed in peninsular India and represent about one third of all amphibian species known in India. The descriptions are simple and contain, although limited, details of other closely-related species, taking the actual number of amphibian species discussed to well over 100. The many illustrations provided throughout the species accounts and the illustrated keys should make it possible for students and amateur naturalists to identify amphibians in the field without much difficulty. To avoid any confusion that might arise from scientific names that keep changing, those names that have been the most consistently used in India names that have been retained in this book. However, all recent changes have been included as synonyms. Additionally, an appendix that lists out all the

known species of Indian amphibians (at the time that the book was written) has been provided.

2004	284 pp.	Paperback
978–81–7371–514–3		₹ 1,410.00

Birds, Wild Animals and Agriculture

Tara Gandhi
Conservationist and ornithologist, India



The agriculture–wildlife relationship in India is a multidimensional one, ranging from serious conflict situations to varying levels of tolerance and coexistence. Changes in land use patterns and the population explosion have resulted in increased proximity between humans and wildlife. Birds, however, are generally welcomed by farmers for their many useful roles in agriculture.

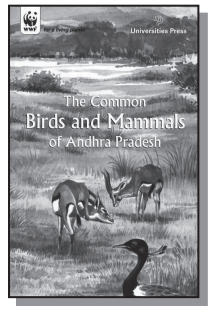
It is increasingly evident that a way has to be found for humans and wild fauna to live together, ideally in mutually beneficial situations. This book explains the need for a multi-sectoral, locale-specific approach to mitigate distress and to encourage an agreeable relationship between humans and animals. It examines the complexities of the problems concerning conflict and looks at examples of harmonious co-habitation. It is hoped that this work will be useful for agriculturists, wildlife conservationists, students and NGOs working in this field, and also stimulate interest among government policy makers and implementation agencies.

Contents: *Preface* ◆ *Acknowledgements* ◆ **Part I**: **Aspects of Human–wildlife Conflict and Coexistence** ◆ The Relationship between Birds, Wild Animals and Agriculture in India ◆ Causes of Conflict ◆ The Effect of Agriculture–Wildlife Conflict on Farming Families ◆ Threats to Wildlife in the Agricultural Landscape ◆ Resolving Wildlife–Agriculture Conflict and Promoting Coexistence ◆ Building Capacity and Raising Awareness ◆ Policies and Strategies to Prevent Conflict ◆ Overview of Crop-protection Methods Commonly Used in India ◆ **Part II**: **Birds and Agriculture** ◆ Many Dimensions of the Bird–Agriculture Relationship ◆ Farmer's Friends—Birds that are Beneficial to Agriculture ◆ Threats to Birds Beneficial in Agriculture and Conservation Issues ◆ Crop Damage by Birds ◆ Protecting Crops from Bird Damage ◆ Conserving and Encouraging Birds Beneficial in Agriculture ◆ **Part III: Common Wild Animal Crop Depredators** ◆ Monkeys ◆ Rhesus Macaque ◆ Bonnet Macaque ◆ Hanuman Langur ◆ Ungulates ◆ Indian Wild Boar ◆ Nilgai or Blue Bull ◆ Chital or Spotted Deer ◆ Blackbuck 154 Gaur or Indian Bison ◆ Asian Elephant ◆ Indian Crested Porcupine ◆ **Part IV: Case Studies** ◆ Bird Case Studies ◆ Bird + Animal Case Studies ◆ Animal Case Studies ◆ *Bibliography* ◆ *Appendix* ◆ *Index*

2015	224 pp.	Paperback
978–81–7371–951–6		₹ 1,170.00

Common Birds and Mammals of Andhra Pradesh, The

WWW–India's Andhra Pradesh State Office



Exquisitely illustrated, this field guide to the common birds and mammals found in Andhra Pradesh describes 157 birds and 42 mammals that commonly occur in the state, with details of their characters, habits and habitat. The book also has information on:

- ecosystems found in the state
- areas listed as protected, with details on the location, accessibility, and the special features of the sanctuaries and national parks
- checklists of birds from a few bird areas in the state

- the protected status of birds and mammals of Andhra Pradesh

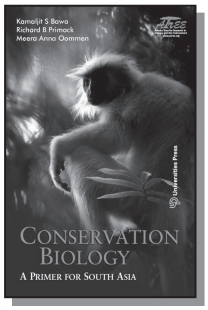
2009	**164 pp.**	**Paperback**
978–81–7371–653–9		**₹ 930.00**

Conservation Biology: A Primer for South Asia

Kamaljit S Bawa
Distinguished Professor of Biology, University of Massachusetts, Boston

Richard B Primack
Professor, Department of Biology at Boston University, Boston

Meera Anna Oommen
Ecologist and Founding trustee, Dakshin Foundation, Bangalore



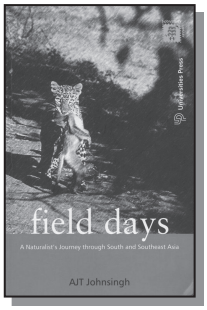
This introductory book on conservation biology is based on Richard Primack's widely used *A Primer of Conservation Biology*. It explores the key concepts of conservation using examples from South Asia, home to some of the world's most exotic species that are now facing the threat of extinction. The book draws attention to the rapid decline in the biodiversity of this region and emphasises the need for urgent action. It also discusses the initiatives that are being undertaken in the region such as involving local communities, framing laws and policies, and identifying research areas that will help stem further loss in biodiversity and make the long term goal of protecting our species successful.

Special Features: Numerous case studies from South Asia ◆ Discusses the involvement of indigenous tribes in preserving biodiversity ◆ Outlines specific research areas that are to be focussed on for implementation of successful conservation programmes

2011	**604 pp.**	**Paperback**
978–81–7371–724–6		**₹ 1,740.00**

Field Days – A Naturalist's Journey through South and Southeast Asia

A J T Johnsingh
Former Dean, Faculty of Wildlife Sciences, Wildlife Institute of India, Dehra Dun, India

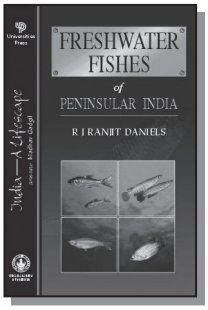


As a young boy in south India, AJT Johnsing avidly read Jim Corbett in Tamil translation: apart from the nail-biting adventure, Corbett's writing provided fine details on the landscapes, forests and wildlife of the Himalaya, observing and interpreting perfectly the sights, sounds and smells of the jungle. Growing up to become a wildlife biologist of great repute, Dr Johnsingh gained access to some of the most lush and remote forests in the world, and began to record his observations carefully. Each of the thirty-seven articles in this book is a journey into a protected forest, some well-known and others rarely accessed. Nearly always a long walk is involved, a walk that picks up details that an untrained eye would easily miss. Close encounters with temperamental tuskers, protective elephant mothers, reclusive tigers, poachers, villagers, tribal communities and forest guards pepper these walks. Dr Johnsingh's analyses include his deep concern for the tremendous challenge ahead if these places and their inhabitants are to be conserved in the face of an alarming onrush of humanity. Each journey, finally, involves a thoroughly enjoyable understanding of the protected area, its history, people, plants and wildlife.

2005	**256 pp.**	**Paperback**
978–81–7371–552–5		**₹ 1,11t0.00**

Fresh Water Fishes of Peninsular India

R J Ranjit Daniels
Founder and Director, Care Earth



This is a lucidly written field guide describing 75 taxa of fishes that commonly inhabit the fresh waters of Peninsular India. This can serve as a good addition to the existing Biology textbooks as many of the species have not been studied until now. The book is lavishly illustrated with black and white illustrations, line drawings as well as colour photographs. Common English and local names are given in addition to scientific nomenclature for the fishes.

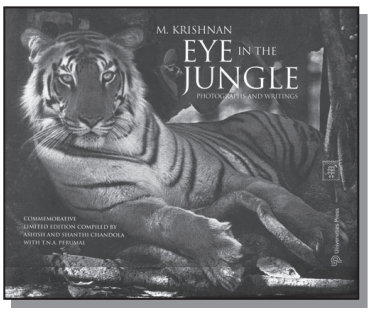
2001	**224 pp.**	**Paperback**
978–81–7371–409–2		**₹ 1,345.00**

M. Krishnan: Eye in the Jungle – Photographs and Writings

Ashish Chandola
Freelance cameraman

Shanti Chandola
Freelance field assistant

Thanjavur Nateshachary Ayyam Perumal
Nature Photographer



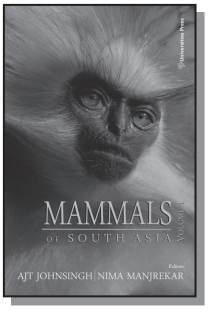
M Krishnan (1912–1996) was endowed with a wide range of interests and amazing prowess as a writer in both his native Tamil and English. He wrote on anything that caught his attention, from dog-shows to cricket, local breeds of cattle to temple carvings, squirrels in his backyard to elephants, gaur and mouse deer of the forests. He did not just write occasionally, but wrote steadily and inspiringly for well over 35 years. A pioneer in the field of black & white photography, Krishnan's contribution to wildlife photography and writing on natural history in India has no parallel. In this special compilation, an effort has been made to select lively and anecdotal text for which Krishnan has been recognized, to accompanyu images that he created which are in a class of their own. E.P. Gee, the eminent naturalist and Forest Officer, described Krishnan in the following words in his famous book, the Wildlife of India, first published in 1964: "I think of M Krishnan, one of the best naturalists of present day India. He is middle-aged, active and does a lot of writing on natural history for newspapers and magazines. he is an artist also, and an expert wildlife photographer. 'Every Hair' must be his motto, for his pictures show the finest detail of the coats of gaur, sambar, chital and the life, and every wrinkle on the skin of a wild elephant...He is a bit of a 'lone wolf', one who does not care for meetings or advisory boards, but as a naturalist had no equal..."

2005	**128 pp.**	**Hardback**
978–81–7371–554–9		**₹ 3,500.00**

Mammals of South Asia, The – Volume 1

PRINT ON DEMAND

AJT Johnsingh
Former Dean, Faculty of Wildlife Sciences, Wildlife Institute of India, Dehra Dun, India



Nima Manjrekar
Wildlife biologist, India

A complete guide to the mammals of South Asia, lavishly illustrated with colour plates and photos. The species accounts cover all aspects of field identification, including in-depth sections on distribution, behaviour, status and population. Anyone interested in the wildlife of the subcontinent will find this book an invaluable aid to identifying and understanding the region's diverse mammalian fauna.

Volume 1 covers insectivores, bats, primates, canids and felids, while Volume 2 focuses on marine mammals, elephant, rhinoceros, bovids, cervids, and rodents.

Over 75 authors have contributed on areas of specialised research. Many of the species, like the Arunachal macaque, are covered in such detail for the first time in a popular publication.

Contents: *Preface* ◆ *Acknowledgements* ◆ *Foreword* ◆ Introduction (**Order: Insectivora**) ◆ Insectivores (**Order: Scandentia**) ◆ Treeshrews (**Order: Chiroptera**) ◆ Bats (**Order: Primates**) (*Family*: Lorisidae) ◆ Slender loris ◆ Slow loris (*Family*: Cercopithecidae) ◆ Lion-tailed macaque ◆ Rhesus macaque ◆ Bonnet macaque ◆ Toque macaque ◆ Assamese macaque ◆ Arunachal macaque ◆ Grey langur ◆ Nilgiri langur ◆ Golden langur ◆ Phayre's langur ◆ Capped langur ◆ Purple-faced langur (*Family*: Hylobatidae) ◆ Hoolock gibbon (**Order**: **Carnivora**) ◆ (*Family*: Canidae) ◆ Indian fox ◆ Golden jackal ◆ Indian wolf ◆ Asiatic wild dog ◆ (*Family*: Ursidae) ◆ Asiatic black bear ◆ Himalayan brown bear ◆ Sloth bear ◆ (*Family*: Procyonidae) ◆ Red panda ◆ *Family*: Herpestids, Viverrids and Mustelids ◆ Otters ◆ (*Family*: Hyaenidae) ◆ Striped hyena ◆ (*Family*: Felidae) ◆ Small cats ◆ Snow leopard ◆ Leopard ◆ Asiatic lion ◆ Tiger ◆ *List of contributors* ◆ *Species index*

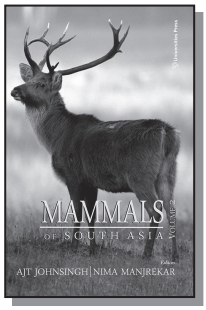
2012	766 pp.	Paperback
978–81–7371–590–7		₹ 3,500.00

Mammals of South Asia, The – Volume 2

PRINT ON DEMAND

AJT Johnsingh
Former Dean, Faculty of Wildlife Sciences, Wildlife Institute of India, Dehra Dun, India

Nima Manjrekar
Wildlife biologist, India



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Over 75 authors have contributed on areas of specialised research. Many of the species, like the Arunachal macaque, are covered in such detail for the first time in a popular publication.

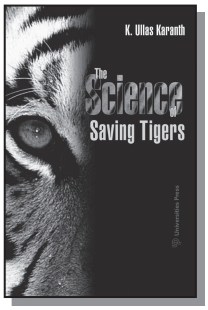
Contents: *Preface* ◆ *Acknowledgements* ◆ *Foreword* ◆ Introduction (**Order: Cetacea, Sirenia**) ◆ Marine mammals (**Order: Cetacea**) ◆ Ganges river dolphin (**Order: Proboscidea**) ◆ Asian elephant (**Order: Perissodactyla**) ◆ (*Family*: Rhinocerotidae) ◆ Greater one-horned rhinoceros (*Family*: Equidae) ◆ Wild asses (**Order: Artiodactyla**) ◆ (*Family*: Suidae) ◆ Pygmy hog (*Family*: Tragulidae) ◆ The chevrotains ◆ (*Family*: Moschidae) ◆ Musk deer (*Family*: Cervidae) ◆ Muntjac or barking deer ◆ Chital ◆ Sambar ◆ Barasingha (Indian swamp deer) ◆ Eld's deer ◆ Hog deer ◆ (*Family*: Bovidae) ◆ Gaur ◆ Nilgai ◆ Chousingha or four-horned antelope ◆ Blackbuck ◆ Chinkara or Indian gazelle ◆ Serow ◆ Goral ◆ Takin ◆ Himalayan tahr ◆ Nilgiri tahr ◆ Himalayan ibex ◆ Bharal ◆ Other wild goats and sheep (**Order: Rodentia**) ◆ (*Family*: Sciuridae) ◆ Indian giant squirrel ◆ Grizzled giant squirrel ◆ Sciurids ◆ (*Family*: Muridae) ◆ South Asian muroids (*Family*: Hystricidae) ◆ Indian crested porcupine ◆ Little-known mammals ◆ Diseases and

parasites of wild mammals ◆ Checklist of mammals of South Asia ◆ *List of contributors* ◆ *Species index*

2015	**766 pp.**	**Paperback**
978–81–7371–589–1		**₹ 3,500.00**

Science of Saving Tigers, The

Ullas Karanth
Scientist, Conservation activist



The Science of Saving Tigers puts together twenty significant articles on topics ranging from tiger ecology to critiques of government policy from a selection of over seventy that have appeared in various national and international journals, spanning Dr Karanth's work over two decades. It is essential reading for serious students of conservation biology and will serve as a vital information resource for tiger conservationists in particular.

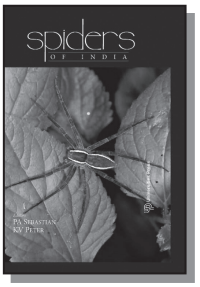
2011	**340 pp.**	**Paperback**
978–81–7371–609–6		**₹ 1,555.00**

Spiders of India

PRINT ON DEMAND

P A Sebastian
Reader, Division of Arachnology, Sacred Heart College, Kochi

K V Peter
Former Vice–Chancellor, Kerala Agricultural University



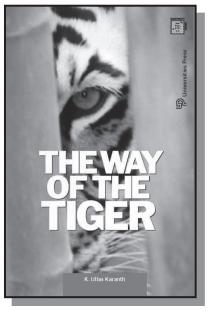
This is the only modern book available on the subject, and will prove an invaluable resource for professionals, students, naturalists, and researchers in zoology, entomology, ecology and physiology.

The first part of the book looks at the morphology and anatomy of spiders, as well as systematics and evolution. The second part provides detailed descriptions of selected species. The book also contains, importantly, a decisive and updated checklist of the 1,520 spiders which have been described from India. It is richly illustrated with line drawings and diagrams, and more than 150 colour photographs, many documented for the first time.

2009	**734 pp.**	**Hardback**
978–81–7371–641–6		**₹ 2,350.00**

Way of the Tiger, The

Ullas Karanth
Conservation scientist, Wildlife Conservation Society, New York



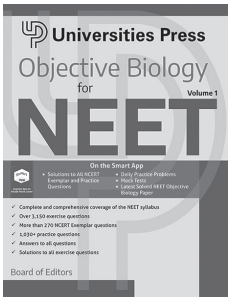
The Way of the Tiger was first published in the UK and US as a coffee-table book on tigers. This special South Asia edition carries Dr Karanth's excellently written text, without the pictures. This book tells you everything you want to know about tigers. It is an outstanding primer on tigers and very simply and well-written; a scientist writing about his subject for a popular audience. The author talks about the human fascination for tigers, and then examines social and predatory behaviour in wild tigers; evolution and genetics; research and census methods; threats, past and present, to the existence of this endangered mega-carnivore; and various conservation policies necessary to reverse the decline of tigers. What sets it apart is the positive conservation message that underlines the text; the author disagrees with 'doomsday prophecies' and convincingly argues that wild tigers can be saved with timely action guided by reliable knowledge.

2006 **144 pp.** **Paperback**
978–81–7371–556–3 **₹ 725.00**

NEET

Objective Biology for NEET, Volume 1

Board of Editors



This book provides all the knowledge, practice and coaching that students need to crack the NEETBiology exam.

Volume 1 deals with the topics covered in Class 11, comprising the living world; biological classification; the plant and animal kingdoms; morphology and anatomy of flowering plants; structural organisation in animals; cell, cell cycle and cell division; biomolecules;transportation,mineral nutrition, photosynthesis, respiration and growth and development in plants; digestion andabsorption; breathing and exchange of gases, body fluids and their circulation; excretory productsand their elimination; locomotion and movement; neural control and coordination; and chemicalcontrol and integration.

Salient features:

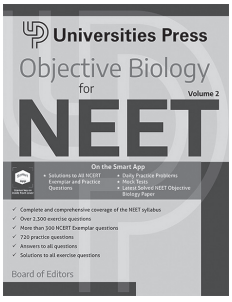
- Comprehensive compilation of objective questions from previous years' NEET papers
- Exercises comprise multiple choice, true/ false, fill in the blank, match the following and diagram-oriented questions
- Indispensable compendium enables students to prepare with efficiency and accuracy
- One-stop knowledge and practice treasure-trove for students that will help them to honetheir time management skills and create a unique strategic approach for the exam
- The Android app accompanying the book contains practice problems, mock tests, solved NEET question papers from 2020 onwards and solutions to NCERT Exemplar and practice questions

Contents: *Preface* ◆ The Living World ◆ Biological Classification ◆ Plant Kingdom ◆ Animal Kingdom ◆ Morphology of Flowering Plants ◆ Anatomy of Flowering Plants ◆ Structural Organisation in Animals ◆ Cell: The Unit of Life ◆ Biomolecules ◆ Cell Cycle and Cell Division ◆ Transport in Plants ◆ Mineral Nutrition ◆ Photosynthesis in Higher Plants ◆ Respiration in Plants ◆ Plant Growth and Development ◆ Digestion and Absorption ◆ Breathing and Exchange of Gases ◆ Body Fluids and their Circulation ◆ Excretory Products and their Elimination ◆ Locomotion and Movement ◆ Neural Control and Coordination ◆ Chemical Control and Integration

2022 **452 pp** **Paperback**
978-93-89211-70-2 **₹ 600.00**

Objective Biology for NEET, Volume 2

Board of Editors



This book provides all the knowledge, practice and coaching that students need to crack the NEET Biology exam. Volume 2 deals with the topics covered in Class 12, comprising reproduction in organisms; sexual reproduction in flowering plants; human reproduction; reproductive health; principles ofinheritance and variation; molecular basis of inheritance; evolution; human health and diseases;strategies for enhancement in food production; microbes in human welfare; biotechnology–principles, processes and applications; organism and population; ecosystem;

biodiversity andconservation; and environmental issues.

Salient features:

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Contents: *Preface* ⋄ Reproduction in Organisms ⋄ Sexual Reproduction in Flowering Plants ⋄ Human Reproduction ⋄ Reproductive Health ⋄ Principles of Inheritance and Variation ⋄ Molecular Basis of Inheritance ⋄ Evolution ⋄ Human Health and Diseases ⋄ Strategies for Enhancement in Food Production ⋄ Microbes in Human Welfare ⋄ Biotechnology – Principles and Processes ⋄ Biotechnology and its Applications ⋄ Organism and Population ⋄ Ecosystem ⋄ Biodiversity and Conservation ⋄ Environmental Issues

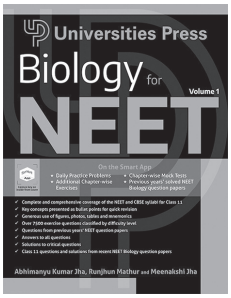
2022	344 pp	Paperback
978–93–89211–71–9		₹ 375.00

Biology for NEET, Volume 1

Abhimanyu Kumar Jha
Professor and Head, Department of Biotechnology, School of Engineering and Technology, Sharda University,Greater Noida, India

Runjhun Mathur
Research Scholar, Dr. A.P.J. Abdul Kalam Technical University,Lucknow, India

Meenakshi Jha
Research Scholar, Amity University, Raipur, India



This book aims to prepare medical aspirants for the NEET Biology examination.

Volume 1 explores the topics studied in Class 11. It provides in-depth coverage of the NEET syllabus and uses a target-oriented approach, with greater emphasis on the basics and gradual progression to advanced topics. It works towards maximizing students' knowledge of the subject while also enhancing their problem-solving and time management abilities.

Salient features:

- Complete coverage of all topics as per the NEET syllabus
- Content presented as bullet points, making it more reader-friendly
- Over 5250 exercise questions (with answers) categorized based on difficulty level
- Over 2250 questions (with answers) from previous years' NEET papers
- Tips and tricks to help students remember and recall important concepts
- Android app with daily practice problems, additional chapter-wise exercises, mock tests and previous years' solved NEET Biology question papers

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and Integration ◆ *Class 11 Questions and Solutions from Previous Years' NEET Biology Question Papers*

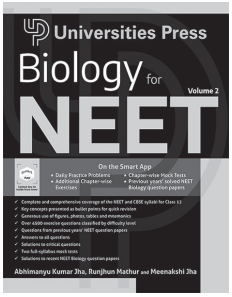
2023	680 pp	Paperback
978–81–95400–93–5		₹ 1,100.00

Biology for NEET, Volume 2

Abhimanyu Kumar Jha
Professor and Head, Department of Biotechnology, School of Engineering and Technology, Sharda University, Greater Noida, India

Runjhun Mathur
Research Scholar, Dr. A.P.J. Abdul Kalam Technical University,Lucknow, India

Meenakshi Jha
Research Scholar, Amity University, Raipur, India



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Salient features:

- Complete coverage of all topics as per the NEET syllabus
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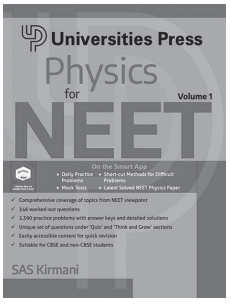
- Over 3000 exercise questions (with answers) categorized based on difficulty level
- Over 1500 questions (with answers) from previous years' NEET papers
- Tips and tricks to help students remember and recall important concepts
- Android app with daily practice problems, additional chapter-wise exercises, mock tests and previous years' solved NEET Biology question papers

Contents: *About the Authors* ◆ *Preface* ◆ *Acknowledgements* ◆ Reproduction in Organisms ◆ Sexual Reproduction in Flowering Plants ◆ Human Reproduction ◆ Reproductive Health ◆ Principles of Inheritance and Variation ◆ Molecular Basis of Inheritance ◆ Evolution ◆ Human Health and Disease ◆ Strategies for Enhancement in Food Production ◆ Microbes in Human Welfare ◆ Biotechnology – Principles and Practices ◆ Biotechnology and Its Applications ◆ Organisms and Populations ◆ Ecosystem ◆ Biodiversity and Its Conservation ◆ Environmental Issues ◆ *Mock Test I* ◆ *Mock Test II* ◆ *Previous Years' Solved Question Papers*

2023	468 pp	Paperback
978–81–95400–94–2		₹ 750.00

Physics for NEET, Volume 1

SAS Kirmani
Founder, Erose Educational Infotech Private Limited, New Delhi, India



This book conforms to the latest NEET syllabus. Volume 1 of the book covers the NCERT syllabus for Class XI. The questions compiled in the book are in strict accordance with the current trend seen in the CBSE and NEET examinations. The book provides a clear and logical presentation of the basic concepts, principles and their applications. It discusses a broad range of problems with sound physical arguments and problem-solving methodology. Each chapter is supplemented with a set of 'Quick Questions' framed under 'Quiz' and 'Think and Grow' sections to promote logical thinking and a spirit of inquiry among the students. The book also has app-based content that includes

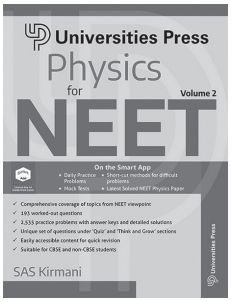
daily practice problems and mock tests for quick revision.

Contents: Units and Dimensions ◆ Kinematics ◆ Laws of Motion ◆ Work, Energy, Power ◆ Motion of System of Particles and Rigid Body ◆ Gravitation ◆ Properties of Bulk Matter ◆ Thermodynamics ◆ Behaviour of Perfect Gas and Kinetic Theory ◆ Oscillations and Waves

2022	784 pp	Paperback
978-93-89211-67-2		₹ 795.00

Physics for NEET, Volume 2

SAS Kirmani
Founder, Erose Educational Infotech Private Limited, New Delhi, India



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Contents: Electrostatics ◆ Current Electricity ◆ Magnetic Effects of Current and Magnetism ◆ Electromagnetic Induction and Alternating Current ◆ Electromagnetic Waves ◆ Optics ◆ Dual Nature of Matter and Radiation ◆ Atoms and Nuclei ◆ Electronic Devices

2022	624 pp	Paperback
978-93-89211-68-9		₹ 625.00

Chemistry for NEET, Volume 1 • FORTHCOMING

M P Sidana
Director, Wisdom Classes by Sidana, and President, Sidana Group of Institutes and Sidana Multispeciality Hospital, Amritsar, India

This book is a comprehensive resource for students of Class XI, preparing for the NEET and other medical entrance examinations. Every chapter starts with clear explanations for all the required topics. This is followed by Multiple Choice Questions segregated topic-wise with an increasing level of difficulty under each topic. *Match the Following* and *Assertion–Reason questions* are provided for each chapter. In addition, NCERT questions are solved in all the relevant chapters.

Contents: Basic concepts of chemistry ◆ Structure of the atom ◆ Classification of elements and periodicity of properties ◆ Chemical bonding ◆ States of matter ◆ Thermodynamics ◆ Chemical equilibrium ◆ Ionic equilibrium ◆ Redox reactions ◆ Hydrogen and its compounds ◆ *s*-Block elements ◆ *p*-Block elements ◆ Organic chemistry ◆ Hydrocarbons

Chemistry for NEET, Volume 2 • FORTHCOMING

M P Sidana
Director, Wisdom Classes by Sidana, and President, Sidana Group of Institutes and Sidana Multispeciality Hospital, Amritsar, India

This book is a comprehensive resource for students of Class XII, preparing for the NEET and other medical entrance examinations. Every chapter starts with clear explanations for all the required topics. This is followed by Multiple Choice Questions segregated topic-wise with an increasing level of difficulty under each topic. *Match the Following* and *Assertion–Reason questions* are provided for each chapter. In addition, NCERT questions are solved in all the relevant chapters.

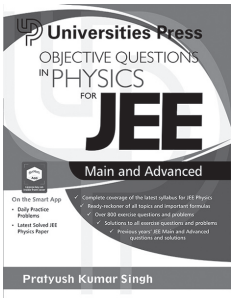
Contents: Solid state ◆ Solutions ◆ Electrochemistry ◆ Chemical kinetics ◆ Surface chemistry ◆ General principles and processes of isolation of elements ◆ *p*-Block elements ◆ *d*- and *f*-block elements ◆ Coordination compounds ◆ Haloalkanes and

haloarenes ◆ Alcohols, phenols and ethers ◆ Aldehydes, ketones and carboxylic acids ◆ Organic compounds containing nitrogen ◆ Biomolecules ◆ Principles related to practical chemistry

JEE

Objective Questions in Physics for JEE Main and Advanced

Pratyush Kumar Singh
Founder of an IIT coaching centre in Ranchi, India



This book has been designed to provide students withintensive as well as extensive practice of the questions andproblems they will encounter in the JEE Physics exams. Theaim of this book is to improve and enhance the aptitude, proficiency and problem-solving ability of students in Physics to enable them to crown their endeavours with success.

Salient features:

- Key concepts at the beginning of every chapter to summarise the important principles
- Key equations and formulas presented for every topic
- Detailed, step-by-step solutions to all questions and problems
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Contents: *Preface* ◆ *Acknowledgements* ◆ **PART I: MECHANICS** ◆ Physical Quantities and Measurement ◆ Kinematics ◆ Force and Motion ◆ Work–Energy ◆ Linear Momentum and Collision ◆ Torque and Angular Momentum ◆ Elasticity ◆ Fluid Mechanics ◆ Surface Tension and Viscosity ◆ Gravitation ◆ Simple Harmonic Motion ◆ Mechanical Waves ◆ **PART II: THERMODYNAMICS** ◆ Calorimetry, Thermal Expansion and Heat Transfer ◆ Gas Laws and First Law of Thermodynamics ◆ **PART III: ELECTRICITY AND MAGNETISM** ◆ Electrostatic Field and Potential ◆ Current Electricity ◆ Capacitors ◆ Magnetism ◆ Electromagnetic Induction ◆ AC Circuits and EM Waves ◆ **PART IV: OPTICS AND MODERN PHYSICS** ◆ Geometrical Optics ◆ Atomic Physics ◆ Nuclear Physics ◆ Wave Optics ◆ *Appendix I: Previous Years' JEE Main Questions and Solutions* ◆ *Appendix II: Previous Years' JEE Advanced Questions and Solutions*

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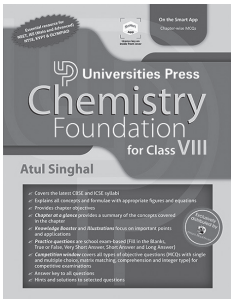
FOUNDATION SERIES

Chemistry Foundation for Class VIII

Atul Singhal
Academic Head, Aakash Institute, Modipuram, Meerut, India



This book is a comprehensive resource for students of Class VIII preparing for the CBSE and ICSE Board examinations. It provides clear and concise explanations and covers all topics in these syllabi, along with a variety of problems drawn from the current and previous years' question papers. Solutions are provided to every single problem along with hints to crack the tough ones. The book provides a strong foundation which the increasing competition mandates.

Salient features

- The entire curriculum is covered in a lucid manner accompanied by illustrations, equations and formulae.
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Chemistry Foundation for Class IX

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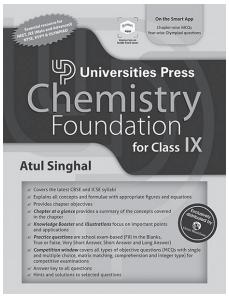
Academic Head, Aakash Institute, Modipuram, Meerut, India



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- The book is accompanied by the Orient BlackSwan Smart App that provides chapter-wise NEET–JEE type MCQs and Year-wise Olympiad Question Papers with solutions.

Contents: *Preface* ◆ *Acknowledgements* ◆ Matter in Our Surroundings ◆ Is Matter Around Us Pure? ◆ Atoms and Molecules ◆ Chemical Reactions and Equations ◆ Atomic Structure ◆ The Periodic Table ◆ Chemical Bonding ◆ Gaseous State ◆ Water ◆ Hydrogen ◆ Atmospheric Pollution

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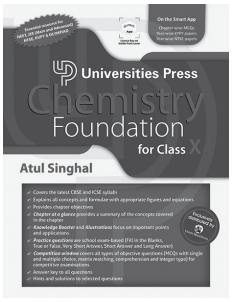
Chemistry Foundation for Class X

Atul Singhal
Academic Head, Aakash Institute, Modipuram, Meerut, India



This book is a comprehensive resource for students of Class X preparing for the CBSE and ICSE Board examinations. It provides clear and concise explanations and covers all topics in these syllabi, along with a variety of problems drawn from the current and previous years' question papers. Solutions are provided to every single problem along with hints to crack the tough ones. The book provides a strong foundation which the increasing competition mandates.

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- The exercises are divided into *Practice questions* (school exam-based) and *Competition window* (competitive exam-based).
- Various types of questions are included—very short, short and long.
- Topic-wise and level-wise MCQs in each chapter (first of its kind).
- Related advanced level concepts highlighted in boxes (*Knowledge booster*).
- Segment-wise questions and solutions for school exams in each chapter.
- Provides a strong foundation for students of different state boards.
- The book is accompanied by the Orient BlackSwan Smart App that provides chapter-wise NEET–JEE type MCQs, year-wise KVPY papers and year-wise NTSE papers with solutions.

Contents: *Preface* ◆ *Acknowledgements* ◆ Chemical Reactions and Equations ◆ Mole Concept, Stoichiometry and Behaviour of Gases ◆ Atomic Structure ◆ Periodic Table and Periodic Properties ◆ Chemical Bonding ◆ Acids, Bases and Salts ◆ Electrolysis and Electrochemistry ◆ Metals and Non-metals ◆ Carbon and its Compounds ◆ Organic Chemistry ◆ Chemical Kinetics and Chemical Equilibrium ◆ Study of Compounds ◆ *Appendices*

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Biology Foundation for Class VIII

Abhimanyu Kumar Jha
Professor and Head of the Department of Biotechnology, School of Engineering and Technology (SET), Sharda University, Greater Noida, India

Abhinav Datta
Biology Teacher, Shiv Nadar School, Noida, India

Mahek Sharan
Research Scholar in Zoology, Banaras Hindu University, Varanasi, India

This book is an excellent preparation resource in Biology for students of Class VIII appearing for

the CBSE and ICSE examinations. It provides clear and concise explanations and coversall the topics in these syllabi, along with a variety of exercise questions drawn from thecurrent and previous years' question papers. Answers or hints are provided for every singlequestion.

This book provides a strong foundation that students can build on to realise their academic aspirations.

Salient features

- Covers the CBSE and ICSE syllabi and serves as a base for competitive examinationpreparation
- Presents clearly defined objectives at the beginning of every chapter
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- Demarcates exercises as Practice Questions (school exam-based) and CompetitionWindow (competitive exam-based)
- Includes 1,385 school exam-based and competitive exam-based questions
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Contents: *About the Authors* ⌖ *Preface* ⌖ *Acknowledgements* ⌖ Cells: Structure and Functions ⌖ Adolescence ⌖ Reproduction in Animals ⌖ The Circulatory System ⌖ Neural and Endocrine Systems ⌖ Microorganisms: Friends or Foes? ⌖ Health, Hygiene and First Aid ⌖ Transportation and Reproduction in Plants ⌖ Crop Production and Management ⌖ Ecosystem and Biodiversity ⌖ Conservation of Plants and Animals

2023	**240 pp**	**Paperback**
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Biology Foundation for Class IX

Abhimanyu Kumar Jha
Professor and Head of the Department of Biotechnology, School of Engineering and Technology (SET), Sharda University, Greater Noida, India

Archana Awasthi
Biology Teacher,Delhi Public School, Ghaziabad, India

Mahek Sharan
Research Scholar in Zoology, Banaras Hindu University, Varanasi, India

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Biology Foundation for Class X

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Archana Awasthi
Biology Teacher, Delhi Public School, Ghaziabad, India

Saurabh Gupta
Research Scholar, Amity University Chhattisgarh, Raipur, India

This book is an excellent preparation resource in Biology for students of Class X appearing for the CBSE and ICSE Board examinations. It provides clear and concise explanations and coversall the topics in these syllabi, along with a variety of exercise questions drawn from thecurrent and previous years' question papers. Answers or hints are provided for every singlequestion.

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- Explains all topics and concepts in a concise manner, with lavish use of illustrations
- Provides a summary at the end of every chapter for quick reference
- Demarcates exercises as Practice Questions (school exam-based) and CompetitionWindow (competitive exam-based)
- Includes 2,100 school exam-based and competitive exam-based questions
- Android app offers additional chapter-wise MCQs

Contents: *About the Authors* ◆ *List of Contributors* ◆ *Preface* ◆ *Acknowledgements* ◆ Cells: The Structural and Functional Units of Life ◆ Structure of Chromosomes, Cell Cycle and Cell Division ◆ Life Processes ◆ Absorption by the Roots: The Processes Involved ◆ Transpiration ◆ Photosynthesis: Provider of Food for All ◆ Genetics and Evolution ◆ Control and Coordination ◆ The Nervous System ◆ The Circulatory System ◆ The Excretory System ◆ The Endocrine Glands – The Producers of Chemical Messengers ◆ How Do Organisms Reproduce? ◆ The Reproductive System ◆ Population – The Increasing Numbers and Rising Problems ◆ Aids to Health ◆ Health Organisations ◆ Our Environment ◆ Pollution – A Rising Environmental Problem ◆ Management of Natural Resources

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Contents: Force and Pressure ◆ Friction ◆ Light ◆ Pollution of Air and Water ◆ Some Natural Phenomena ◆ Sound ◆ Stars and the Solar System ◆ Measurement (Density) ◆ Energy ◆ Chemical Effect of Current ◆ Heat Transfer ◆ Electricity

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Contents: Electricity ⌖ Magnetic and Heating Effects of Current ⌖ Reflection of Light ⌖ Refraction of Light ⌖ Human Eye ⌖ Heat ⌖ Modern Physics

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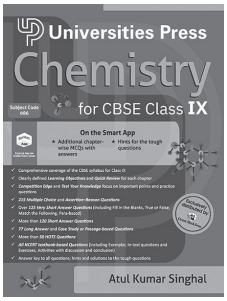
CBSE

Chemistry for CBSE Class IX

Atul Kumar Singhal
Academic Head, Aakash Institute, Modipuram, Meerut



Chemistry for CBSE Class IX is an excellent preparatory book for students. This book provides class-tested material and practice problems that help students understand theory and concepts and, as a consequence, develop problem-solving skills to attempt exams with full confidence.

The book is written in lucid language with a variety of solved examples, and aims to assist students in understanding the subject, even without the help of an instructor, as solutions are provided for most of the questions. In addition, all the questions, exercises and activities from the NCERT textbook are solved.

Salient features

- Structured according to the latest syllabi and exam pattern of the CBSE
- Includes MCQs, Very Short, Short, Long, HOTS and Case-study/Application-based questions
- Includes NCERT exercises and Exemplar questions along with solutions
- The App accompanying this book supports more chapter-wise MCQs for competitive exam practice.

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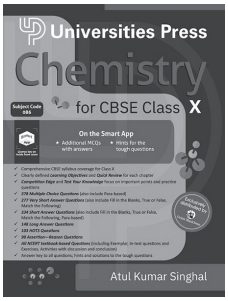
Chemistry for CBSE Class X

Atul Kumar Singhal
Academic Head, Aakash Institute, Modipuram, Meerut



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Salient features

- The entire CBSE curriculum is covered in a lucid manner accompanied by illustrations, equations and formulae.
- Solutions to all problems have been provided with hints for the tough ones.
- Various types of questions: very short, short and long (including Fill in the blanks, Match the following, True or false, Para-based).
- MCQs in each chapter (including Para-based).
- Related advanced level concepts highlighted in boxes (***Competition Edge***).
- ***Test Your Knowledge*** includes concept-based questions with answers.
- The book is accompanied by the **Orient BlackSwan Smart App** that provides chapter-wise MCQs with solutions.

Contents: *Preface* ◆ *Acknowledgements* ◆ Chemical Reactions and Equations ◆ Acids, Bases and Salts ◆ Metals and Non-metals ◆ Carbon and Its Compounds ◆ Periodic Table and Periodic Properties

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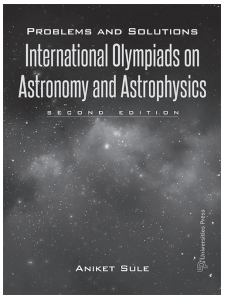
OTHER EXAMINATIONS

Problems and Solutions: International Olympiads on Astronomy and Astrophysics

Aniket Sule
Academic Coordinator, Indian Astronomy Olympiad Programme; Regional Coordinator (Asia–Pacific), IOAA and Reader, Homi Bhabha Centre for Science Education, Tata Institute of Fundamental Research, Mumbai, India



The International Olympiads on Astronomy and Astrophysics (IOAA) are competitions where teams of high-school students from around the world compete in a series of tests and are awarded medals based on their performance. Started in 2007, more than 45 countries have participated in these olympiads. The competition comprises three rounds: theoretical problems, data analysis problems and night sky observation tests. This book presents problems from all the eight IOAAs held thus far. The problems are categorised according to the concepts involved and also graded according to the difficulty level. Solutions to all the problems are provided. Additional notes help make the solutions self-explanatory.

Contents: *Preface* ◆ *Acknowledgments* ◆ *Academic Committees of Previous IOAAs* ◆ *President´s Message* ◆ *A Note about the Problems* ◆ *Table of Constants* ◆ Celestial Mechanics ◆ Celestial Coordinate Systems ◆ Geometric Astronomy and Time ◆ Optics and Detectors ◆ Physics of Stars and Planets ◆ Stellar

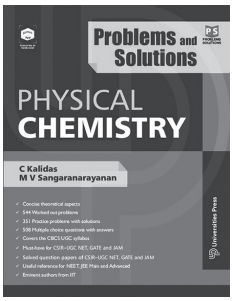
Observations ◆ Binaries and Variables ◆ Galactic Astrophysics ◆ Extragalactic Astrophysics ◆ Night Sky Observation ◆ *Solutions* ◆ *Appendix: Syllabus of IOAA*

2015	304 pp	Paperback
978–81–7371–980–6		₹ 975.00

Problems and Solutions: Physical Chemistry

C Kalidas
Formerly Professor, Department of Chemistry, IIT Madras andEmeritus Scientist (CSIR), IIT Madras, Chennai, India

M V Sangaranarayanan
Dr S R Rajagopalan Institute Chair Professor at the Department of Chemistry, IIT Madras, Chennai, India



This book presents an extensive collection of diverse types of workedout examples, practice problems and multiple choice questions. The aim is to gain adequate expertise in solving a variety of numerical, conceptual and descriptive questions. The level of questions ranges from the fundamental to the advanced, with the hope that the book will be found useful by a wide spectrum of students at all levels. The book is primarily intended as a companion to textbooks in physicalchemistry. The incorporation of different types of multiple choice questions will aid the student to comprehend the subtle aspects of each topic.

Salient Features

- Covers all the main topics of physical chemistry at the undergraduate and post-graduate levels,
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- Covers the CBCS UGC syllabus; authored by eminent professors from IIT,
- Aids preparation for competitive examinations such as **CSIR–UGC NET**, **GATE** and **JAM**,
- Includes solved question papers of CSIR–UGC NET, GATE and JAM,
- Provides access to an App for revision on your Android mobile phone.

Contents: *Preface* ◆ *Fundamental Constants* ◆ Gaseous State ◆ Thermodynamics ◆ Electrochemistry ◆ Chemical Kinetics ◆ Liquid State ◆ Surface Chemistry, Catalysis and Colloids ◆ Solid State ◆ Photochemistry ◆ Solutions ◆ Phase Rule and Phase Equilibrium ◆ Polymer Chemistry ◆ Quantum Chemistry ◆ Acid–Base and Other Ionic Equilibria, Buffers and Buffer Action, Indicators ◆ Nuclear Chemistry ◆ Applications of Statistical Thermodynamics ◆ *Miscellaneous Problems* ◆ *Bibliography* ◆ *Appendix 1: CSIR–UGC NET JRF/ SET Solved Question Paper* ◆ *Appendix 2: GATE Solved Question Paper* ◆ *Appendix 3: JAM Solved Question Paper* ◆ *Index*

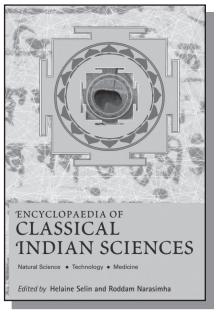
2020	424 pp	Paperback
978–93–89211–18–4		₹ 850.00

Encyclopaedia

Encyclopaedia of Classical Indian Sciences

Helaine Selin
Formerly Professor, Hampshire College, Amherst, USA

Roddam Narasimha
DST Year–of–Science Professor, Jawaharlal Nehru Centre for Advanced Science Research, Bengaluru, India



India's contributions to science and technology are among the most ancient and influential in the world. In mathematics, the decimal place value system with zero as a numeral, used universally today, owes its origin to India. The science of Ayurveda, which has been practised for millennia in India, is now gaining wider acceptance even as many ancient remedies are turned into modern drugs. Indian astronomical computations, ritual geometry, brick technology and metallurgical innovations have been among the finest achievements in the world of science and technology.

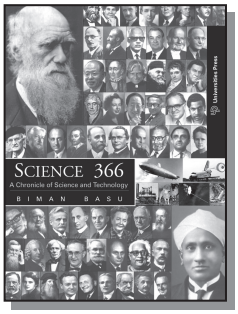
Encyclopaedia of Classical Indian Sciences is an attempt to provide an authentic account of natural science, technology and medicine as practised by Indians and other South Asians. It also includes biographical articles on many ancient Indian scientists, and some articles (polemic in nature) on the history of Indian science and technology, such *as the essay on the effects of colonialism. All articles are contributions of acknowledged authorities on their subject drawn from across the world*.

Available in print and e-book formats.
For details, visit www.universitiespress.com.

2007	**492 pp.**	**Hardback**
978-81-7371-555-6		**₹ 1,600.00**

Science 366: A Chronicle of Science and Technology

Biman Basu
Formerly Editor, Science Reporter, Council of Scientific and Industrial Research (CSIR), New Delhi, India



Dates have an important place in our lives—not only are they historical occasions that we observe every year but they are also milestones to measure our growth in age, prosperity and wisdom. Therefore, dates in the scientific field can be used as a measure of progress in our quest for the unknown—dates when some important scientific discovery was made or some famous scientist was born. There are also dates that mark important breakthroughs in our understanding of the universe around us—new discoveries and new inventions that have changed our life.

This book can be considered a diary of scientific events—both Indian and international—including dates related to scientists and their works; inventors and their inventions; scientific organisations; and important scientific occurrences.

The entries are arranged chronologically. An entry for the date of birth of a scientist or inventor gives a brief biography of the person, while an entry for the date of founding or inauguration of a scientific institution gives a brief summary of the activities and achievements of the institution. All the entries are cross-referenced for easy navigation.

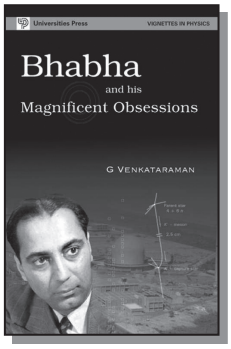
Available in print and e-book formats.
For details, visit www.universitiespress.com.

2008	**712 pp.**	**Paperback**
978-81-7371-607-2		**₹ 2,160.00**

Biographies

Bhabha and His Magnificent Obsessions

G Venkataraman



This book is about the remarkable scientist Homi Jehangir Bhabha who, at the age of eighteen, went to Cambridge to study physics and started his research career there. In 1939, when Bhabha came to India on a short vacation, he was forced to stay on as the Second World War broke out. This was, of course, a blessing for the country as he later steered the country's scientific destiny. The book records Bhabha's contributions which were in many dimensions and not just purely scientific.

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For details, visit www.universitiespress.com.

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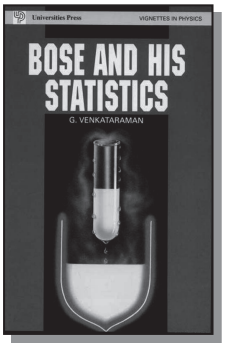
Bose and His Statistics

G Venkataraman



This book describes a monumental discovery made by Satyendranath Bose. It also helps the reader take a step closer in understanding Bose—the scientist—and describes the events that surround this exciting discovery.

Available in print and e-book formats.
For details, visit www.universitiespress.com.

1992	**136 pp.**	**Paperback**
978-81-7371-036-0		**₹ 395.00**

Chandrasekhar and His Limit

G Venkataraman

This is a heartwarming and very inspiring story about Subrahmanyam Chandrasekhar, the most distinguished mathematical physicist India has produced. In a long and remarkable career, Chandrasekhar has done many outstanding things but this book concentrates mostly on one of them, namely, the discovery of the Chandrasekhar Limit.

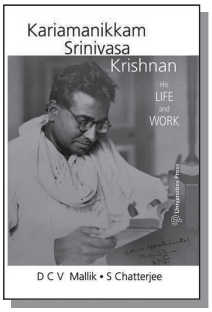
Available in print and e-book formats.
For details, visit www.universitiespress.com.

1992	**144 pp.**	**Paperback**
978-81-7371-035-3		**₹ 565.00**

Kariamanikkam Srinivasa Krishnan: His Life and Work

D C V Mallik
Formerly Professor, Indian Institute of Astrophysics, Bengaluru, India

S Chatterjee
Professor, Indian Institute of Astrophysics, Bengaluru, India



The first four decades of the 20th century were glorious years for science, especially physics. Our view of the physical world changed forever with the emergence of quantum mechanics and Einstein's formulation of the theory of relativity. India too contributed significantly to this scientific revolution with the discoveries made by S N Bose, C V Raman and M N Saha, all in the space of about a decade. *Kariamanikkam Srinivasa Krishnan (1898-1961)* belonged to the same illustrious group. He was perhaps the only Indian physicist of his generation who was equally adept in theory and experiment. Besides a life of excellence in science, Krishnan's destiny led him to be an able science policy maker and administrator. *He was also a great teacher, a humanist and a scholar of Sanskrit, Tamil literature and philosophy.*

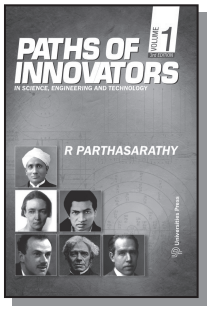
This biography, besides being a detailed and meticulously documented account of Krishnan's life and his scientific work, is also an *exciting account of the history of Indian science of the period. The source material of this work, most of which are being used for the first time, comes from the private papers of K S Krishnan that had remained in the custody of his family.*

2012	516 pp.	Hardback
978–81–7371–748–2		₹ 2,040.00

2011	516 pp.	Paperback
978–81–7371–749–9		₹ 1,560.00

Paths of Innovators, Volume 1

R Parthasarathy
Formerly Professor, Department of Physics, IIT Madras, Chennai, India



This is the first volume of a set of two volumes. It comprises a collection of scientists' lives, their struggles, their achievements and their laurels. The scientists have been grouped under five disciplines—Engineering, Physics, Mathematics, Chemistry and Life Sciences. The reader meets people from various backgrounds—those with insufficient schooling, those with little money, those born into aristocracy, those with science in their blood, those battling with grave illnesses, those who moved from one discipline to another (as different as possible from each other); ultimately culminating in path-breaking scientific discoveries. *The aim of these brief biographical sketches is to inspire a wider audience to take up the noble pursuit of pure sciences.*

Contents: *Engineering:* Appleton, Edward ◆ Arago, Jean ◆ Babbage, Charles ◆ Baird, John ◆ Callendar, Hugh ◆ Carnot, Sadi ◆ Cotton, Arthur ◆ Diesel, Rudolf ◆ Esaki, Leo ◆ Faraday, Michael ◆ Fulton, Robert ◆ Giaever, Ivar ◆ Haber, Fritz ◆ Haggerty, Patrick ◆ Heaviside, Oliver d Henry, Joseph ◆ Hertz, Heinrich ◆ Karman, Theodore von ◆ Kelvin, Lord ◆ Krupp, Alfred ◆ Langmuir, Irving ◆ Marconi, Guglielmo ◆ Ohain, Hans von ◆ Shannon, Claude ◆ Taylor, GI ◆ Terzaghi, Karl ◆ Tesla, Nicola ◆ Steinmetz, Charles ◆ Stephenson, George ◆ Watt, James ◆ Whittle, Frank ◆ Zworykin, Vladimir

Physics: Becquerel, Henri ◆ Bohr, Niels ◆ Boltzmann, Ludwig ◆ Born, Max ◆ Bragg, William Lawrence ◆ Cavendish, Henry ◆ Chadwick, James ◆ Coulomb, Charles ◆ Crookes, William ◆ Dirac, Paul ◆ Doppler, Christian ◆ Fermi, Enrico ◆ Foucault, Jean ◆ Fraunhofer, Joseph ◆ Fresnel, August ◆ Heisenberg, Werner ◆ Helmholtz, Hermann ◆ Huygens, Christian ◆ Kapitza, Peter ◆ Mach, Ernst ◆ Millikan, Robert ◆ Pauli, Wolfgang ◆ Peltier, Jean Charles ◆ Planck, Max ◆ Raman, CV ◆ Roentgen, William ◆ Rutherford, Ernst ◆ Stefan, Josef ◆ van der Waals, Johannes ◆ Wien, Wilhelm ◆ Young, Thomas

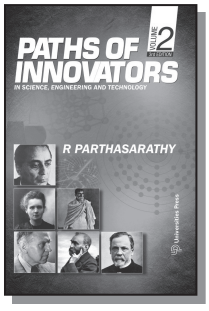
Mathematics: Abel, Henrik ◆ Bessel, Friedrich ◆ Boole, George ◆ Bradley, James ◆ Cantor, Georg ◆ Cauchy, Augustin ◆ Chandrasekar, S ◆ Descartes, Rene ◆ Erdos, Paul ◆ Euler, Leonhard ◆ Fourier, Joseph ◆ Galois, Evariste ◆ Gauss, Carl ◆ Halley, Edmund ◆ Hawking, Stephen ◆ Hilbert, David ◆ Herschel, John ◆ Herschel, William ◆ Lagrange, Joseph ◆ Laplace, Pierre ◆ Leibniz, Gottfried ◆ Pascal, Blaise ◆ Poincare, Henri ◆ Ramachandra, Yasudas ◆ Ramanujan, Srinivasa ◆ Riemann, Bernhard ◆ Wiener, Norbert

Chemistry: Arrhenius, Svante ◆ Avogadro, Amedeo ◆ Berthollet, Claude ◆ Berzelius, Jacob ◆ Black, Joseph ◆ Bunsen, Robert ◆ Dalton, John ◆ Dulong, Pierre ◆ Fourcroy, Antoine ◆ Gay-Lussac, Joseph ◆ Hodgkin, Dorothy ◆ Hofmann, August von ◆ Joliot-Curie, Irene ◆ Kekule, Friederich ◆ Lavoisier, Antoine ◆ Liebig, Justus von ◆ Mendeleev, Dmitri ◆ Perkin, William

2012	456 pp.	Paperback
978–81–7371–750–5		₹ 1,195.00

Paths of Innovators, Volume 2

R Parthasarathy
Formerly Professor, Department of Physics, IIT Madras, Chennai, India



This is the second volume of a set of two volumes. It comprises a collection of scientists' lives, their

struggles, their achievements and their laurels. The scientists have been grouped under five disciplines—Engineering, Physics, Mathematics, Chemistry and Life Sciences. The reader meets people from various backgrounds—those with insufficient schooling, those with little money, those born into aristocracy, those with science in their blood, those battling with grave illnesses, those who moved from one discipline to another (as different as possible from each other); ultimately culminating in path-breaking scientific discoveries. *The aim of these brief biographical sketches is to inspire a wider audience to take up the noble pursuit of pure sciences.*

Contents: *Engineering:* Ampere, Andre-Marie ◆ Benz, Karl ◆ Bessemer, Henry ◆ Bhabha, Homi ◆ Bosch, Carl ◆ Cayley, George ◆ Cockcroft, John ◆ Daimler, Gottlieb ◆ De Laval, Gustav ◆ Francis, James ◆ Grove, Andrew ◆ Guillemin, Ernst ◆ Kaplan, Victor ◆ Kelly, William ◆ Khosla, AN ◆ Korolov, Sergi ◆ Lienthal, Otto ◆ Mond, Ludwig ◆ Morse, Samuel ◆ Otto, Nikolous ◆ Parsons, Charles ◆ Pelton, Lester ◆ Prandtl, Ludwig ◆ Reynolds, Osborne ◆ Sarabhai, Vikram ◆ Seshu, Sundaram ◆ Sperry, Elmer ◆ Tata, JRD ◆ Vishveshwaraya, M ◆ Von Bekesy, Georg ◆ Westinghouse, George ◆ Wheatstone, Charles ◆ Wollaston, William ◆ Wright, Orville ◆ Wright, Wilbur

Physics: Blackett, PMS ◆ Blau, Mariette ◆ Bose, JC ◆ Bose, SN d Boyle, Robert ◆ Brewster, David ◆ Claussius, Rudolf ◆ Compton, Arthur ◆ Curie, Pierre ◆ de Broglie, Louis ◆ Ehrenfest, Paul ◆ Franck, James ◆ Gabor, Dennis ◆ Geiger, Hans ◆ Hahn, Otto ◆ Herzberg, Gerad ◆ Hess, Victor ◆ Kilby, Jack ◆ Kramers, Hendrik ◆ Krishnan, KS ◆ Landau, Lev ◆ Lawrence, Ernest ◆ Lenard, Philip ◆ Lenz, Henirich ◆ Lorentz, Hendrik ◆ Meitner, Lise ◆ Michelson, Albert ◆ Mosley, Henry ◆ Neel, Louis ◆ Oppenheimer, Robert ◆ Rabi, II ◆ Rayleigh, Lord ◆ Rotblat, Joesph ◆ Saha, MN ◆ Schrodinger, Erwin ◆ Seaborg, Glenn T ◆ Smith, George ◆ Sommerfeld, Arnold ◆ Stern, Otto ◆ Szilard, Leo ◆ Weber, Wilhelm ◆ Wilson, CTR

Mathematics: Bolyai, Janos ◆ Bolyai, Wolfgang ◆ Carbano, Gerolomo ◆ Cayley, Arthur ◆ Chebyshev, Pafulty ◆ D'Alembert, Jean ◆ de Moivre, Abraham ◆ De Morgan, Augustus ◆ Dirichlet, Peter ◆ Galileo, Galilei ◆ Green, George ◆ Hamilton, William ◆ Hermite, Charles ◆ Hubble, Edwin ◆ Jacobi, Carl ◆ Klein, Felix ◆ Kronecker, Leopold ◆ Lefschetz, Solomon ◆ Legendre, AM ◆ Louisville, Joseph ◆ Lyapunov, Alexander ◆ Mahalanobis, PC ◆ Moebius, August ◆ Monge, Gaspard ◆ Nash, John ◆ Pierce, Charles ◆ Pluecker, Julius ◆ Poisson, Simon ◆ Ranganathan, SR ◆ Steiner, Jakob ◆ Sylvester, James ◆ Taylor, Brook ◆ Von Neumann, John ◆ Weierstrass, Karl ◆ Whitehead, AN

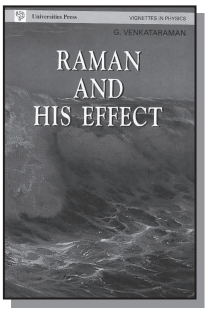
Chemistry: Curie, Marie ◆ Davy, Humphry ◆ Debye, Peter ◆ Fischer, Emil ◆ Ghosh, JC ◆ Gibbs, Willard ◆ Haber, Fritz ◆ Klaproth, Martin ◆ Kopp, Hermann ◆ Le Chatlier, Henry ◆ Lewis, GN ◆ Meyer, Victor ◆ Mitscherlich, Eilhard ◆ Nernst, Walther ◆ Nobel, Alfred ◆ Ostwald, Wilhelm ◆ Pauling, Linus ◆ Priestley, Joseph ◆ Ray, Acharya PC ◆ Seshadri, TR ◆ Soddy, Frederick ◆ Urey, Harold ◆ Van't Hoff, Jacobus ◆ Venkataraman K

Life Science: Banting, Frederick ◆ Eijkman, Christian ◆ Elion, Gertrude ◆ Eysenek, Hans ◆ Fleming, Alexander ◆ Franklin, Rosalind ◆ Hopkins, Frederik ◆ Huxley, Thomas ◆ Jenner, Edward ◆ Koch, Robert ◆ Landsteiner, Karl ◆ Laveran, Alphonse ◆ Linnaeus, Carl ◆ Lister, Joseph ◆ Manson, Patrick ◆ McClintock, Barbara ◆ Mendel, Gregor ◆ Pasteur, Louis ◆ Perutz, Max ◆ Ross, Ronald ◆ Rao, Y Subba ◆ Sahni, Birbal ◆ Salk, Jonas ◆ Sircar, Mahendralal

2012	**544 pp.**	**Paperback**
978–81–7371–751–2		**₹ 1,195.00**

Raman and His Effect

G Venkataraman

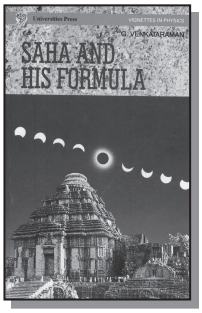


This book deals with the famous Scattering Effect discovered by Sir C. V. Raman. It gives us deep insights into the character of this famous scientist and vividly describes the circumstances surrounding the discovery.

1995	**108 pp.**	**Paperback**
978–81–7371–008–7		**₹ 425.00**

Saha and His Formula

G Venkataraman



A great leap forward in unravelling the mysteries of the Sun occurred way back in 1920 when Meghnad Saha made an important discovery that paved the way for a systematic study of stellar atmospheres in general. This book is about that great discovery and the man who made it.

Available in print and e-book formats.
For details, visit www.universitiespress.com.

1995	**206 pp.**	**Paperback**
978-81-7371-017-9		**₹ 425.00**

Wings of Fire: An Autobiography (Abridged, Special Student Edition with Exercises)

A P J Abdul Kalam
Former President of India

Arun Tiwari
Adjunct Professor, University of Hyderabad, Hyderabad, India

This simplified and abridged version now makes *Dr Kalam's* inspirational story accessible to students. A comprehensive glossary provides help in the understanding of technical terms. *This Special Student Edition includes exercises.*

2004	**144 pp.**	**Paperback**
978-81-7371-548-8		**₹ 350.00**

Wings of Fire: An Autobiography

A P J Abdul Kalam
Former President of India

Arun Tiwari
Adjunct Professor, University of Hyderabad, Hyderabad, India

Avul Pakir Jainulabdeen Abdul Kalam, the son of a little-educated boat-owner in Rameswaram, Tamil Nadu, had an unparalleled career as a defence scientist, culminating in the highest civilian award of India, the *Bharat Ratna*. As chief of the country's defence research and development programme, Kalam demonstrated the great potential for dynamism and innovation that existed in seemingly moribund research establishments. This is the *story of Kalam's rise from obscurity and his personal and professional struggles, as well as the story of Agni, Prithvi, Akash, Trishul and Nag*—missiles that have become household names in India and have raised the nation to the level of a missile power of international reckoning. This is also the saga of independent India's struggle for technological self-sufficiency and defensive autonomy—a story as much about politics (domestic and international) as it is about science.

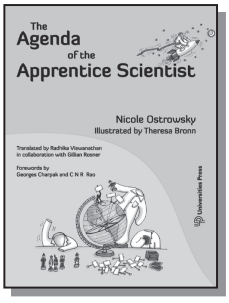
Available in print and e-book formats.
For details, visit www.universitiespress.com.

1999	**212 pp.**	**Paperback**
978-81-7371-146-6		**₹ 495.00**

General Interest

Agenda of the Apprentice Scientist, The

Nicole Ostrowsky
Professor Emeritus, University of Nice Sophia Antipolis, France



Here are *365 activities* to discover that science is a part of our daily life, that you can take part in it with pleasure, that it can be easy, sometimes

surprising and funny, and always *accessible to everyone, from 7 to 107*. All you need to have is a curiosity about the world around you.

Throw yourself into this adventure across the sciences, go at your own pace, follow your fancy and don't necessarily stick to the days of the year. Keep in mind, however, that some activities take place over a couple of days—you will see this as you go. Set your imagination free, do or redo the experiments as you wish, and try and invent better ways to make them work. If you have problems, if you need a clearer explanation, or if you want to share your ideas, you can write to *Nicole.Ostrowsky@unice.fr* or visit *http://apprenticescientist.com*

But most importantly, don't hesitate to play, draw, cut, construct, write and think—there is no better way to learn than through this maxim:

Tell me and I'll forget,
Show me and I may remember,
Involve me and I'll understand.

We recommend that you visit the link:
http://apprenticescientist.com/#/topics/3922325

Available in print and e-book formats.
For details, visit www.universitiespress.com.

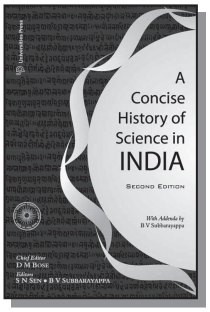
2012	**396 pp.**	**Paperback**
978-81-7371-753-6		**₹ 1,125.00**

Concise History of Science in India, A
(Second Edition)

D M Bose (Ed.)
Formerly Director, Bose Institute, Kolkata, India

S N Sen (Ed.)
Formerly Registrar, Indian Association for the Cultivation of Science, Kolkata, India

B V Subbarayappa (Ed.)
Formerly Executive Secretary, Indian National Science Academy, New Delhi; Project Coordinator and Member Secretary, National Commission for the History of Science in India; Director, Discovery of India Project, at Nehru Centre, Mumbai, India



India's contributions in the field of science have been very influential in the development of human civilisation. The decimal place value system and the Ayurvedic way of life are just two well-known legacies of this ancient culture. Yet there are only a few books which provide an unbiased and authentic view of this world. One reason for this is that the study of Indian science through the ages involves the complex integration of the knowledge of many languages and diverse scientific disciplines. Through the years, there has been growing interest in this study as an important aspect in understanding man's interaction with nature, his material life and cultural patterns. The Indian National Science Academy, through its History of Science Board (1958) and the National Commission for the Compilation of History of Sciences in India (1967) renamed in 1989 as the Indian National Commission for History of Science sought further means to stimulate this interest among universities and scholars. The result was the publication of *A Concise History of Science in India*.

This book attempts to present a brief account of the development of science from early times to Independence, in one of the most ancient civilisations of the world. After nearly four decades since its publication, A Concise History of Science in India remains one of the most extensive and authentic account of Indian science through the ages. Yet further studies in the field have brought to light new material. This revised edition, taken up by B V Subbarayappa, one of the three original editors, seeks to integrate the new information with the knowledge already at hand.

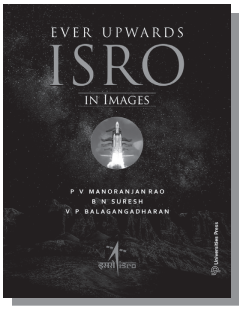
2009	**980 pp.**	**Paperback**
978-81-7371-619-5		**₹ 1,645.00**

Ever Upwards: ISRO in Images

P V Manoranjan Rao
Formerly Group Director, Vikram Sarabhai Space Centre, ISRO

B N Suresh
Chancellor, Indian Institute of Space Science and Technology, Thiruvanthapuram, India; Formerly Director, Vikram Sarabhai Space Centre, ISRO

V P Balagangadharan
Formerly Scientist, Vikram Sarabhai Space Centre, ISRO



The Indian space programme has the unique distinction of being born in a place of worship: the St. Mary Magdalene Church in Thumba, a fishing hamlet near Thiruvananthapuram, the capital of Kerala. From those humble beginnings in 1963, the national space programme grew under the visionary guidance of Vikram Sarabhai and Satish Dhawan to become a technological giant, known today as the Indian Space Research Organisation (ISRO). Sarabhai created ISRO in 1969.

This year, 2019, marks the birth centenary of Sarabhai and the 50th anniversary of ISRO. This book celebrates the double anniversary through over 370 photographs, lovingly curated by the authors from a collection of 2000. Some of them have never before been seen by the public, while others are eye-catchingly beautiful.

The authors have worked on this book for over five years, always keeping abreast with the latest developments in ISRO: from its birth in a church in 1963 to Chandrayaan-2, whose launchis imminent.

This is the story of ISRO told through images. The pictures speak for themselves!

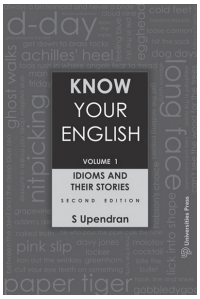
2019 **304 pp.** **Hardback**
978-93-89211-13-9 **₹ 4,560.00**

Know Your English, Volume 1: Idioms and Their Stories

REVISED EDITION

(Second Edition)

S Upendran
Professor, Department of Materials Development, Testing and Evaluation, English and Foreign Languages University, Hyderabad, India

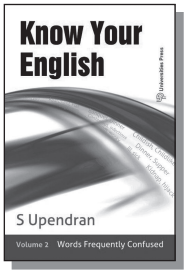


This is the first of our four-volumeseries based on Know Your English, the popular weekly columnpublished in The Hindu since 1982. Teachers, students and those whoare keen on honing their speakingand writing skills will find the seriesuseful. This enlarged and updatedsecond edition contains a selectionof 570 idioms. Each entry gives themeaning of the idiom, providesexamples of its use and, whereverpossible, traces its origins.The selections inthis book are from thosethat featured between1992 and 2018.

2022 **404 pp.** **Paperback**
978-93-86235-60-2 **₹ 835.00**

Know Your English, Volume 2: Words Frequently Confused

S Upendran
Professor, Department of Materials Development, Testing and Evaluation, English and Foreign Languages University, Hyderabad, India



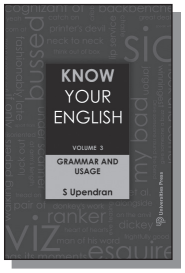
When an Indian decides to settle down in America, does he 'emigrate' or 'immigrate' to that country? What is the difference between 'it's' and 'its'? Should you refer to your fellow coworker as 'my elder colleague', or 'my older colleague'? *Words Frequently Confused*, the second volume in the four volume series, *Know Your English*, clears doubts such as these.

Like the first volume, *Idioms and Their Stories*, this book is based on S Upendran's popular weekly column *Know Your English*, published in *The Hindu*. It contains a selection of about 480 pairs of words that are frequently confused. Each entry gives the meaning of the words and points out the difference between them. Examples are also provided showing how the words can be used in everyday contexts. Some of the entries also contain information about the pronunciation and the etymology (origin) of the word.

2013	416 pp.	Paperback
978–81–7371–730–7		₹ 825.00

Know Your English, Volume 3: Grammar and Usage

S Upendran



Do you enjoy being in 'crowdy' places? What is the plural of 'aircraft' and 'cattle'? Is it 'media are' or 'media is'? Do you have a 'soft spot' or a 'soft corner' for someone? Are you 'good at' or 'good in' cricket? Were you a 'topper' or 'ranker' in school? Why do software engineers want us to 'revert back' to them? Do you pay 'in cash' or 'by cash'? Does your house have a big backside?

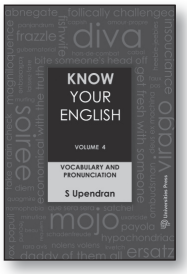
Grammar and Usage, is a practical reference guide that provides answers to such questions. The selections included in the book highlight some of the common errors that we Indians make when we use English.

Like the first and second volumes, this book is based on Upendran's popular weekly column, *Know Your English*, published in *The Hindu*. It contains a selection of over 650 entries, each dealing with an aspect of grammar/usage. Explanations have been provided in simple, jargon-free language.

2017	444 pp.	Paperback
978–81–7371–731–4		₹ 835.00

Know Your English, Volume 4: Vocabulary and Pronunciation

S Upendran



Is 'tier' pronounced the same way as 'tyre'? Which syllable is stressed in 'baton'– the first or the second? How is the word 'danseuse' pronounced? Are you friends with the 'big cheese' on campus? When you watch a film, do youhave a sense of 'déjàvu'?

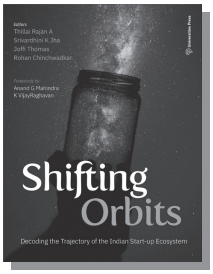
Vocabulary and Pronunciation is a practical reference guide that provides answers to such questions. The selections included in the book highlight some of the everyday words that we mispronounce when speaking in English. In addition, the book familiarises the reader with several hundred words and expressions used by native speakers of English in formalandinformal contexts.

Like the earlier three volumes, this book is based on Upendran's popular weekly column, *Know Your English*, published in *The Hindu*. It contains a selection of over 800 entries; an explanation of the meaning, pronunciation and etymology of each word has been provided.

2018	500 pp.	Paperback
978–81–7371–732–1		₹ 835.00

Shifting Orbits: Decoding the Trajectory of the Indian Start-up Ecosystem

PRINT ON DEMAND



Online resources available

Thillai Rajan A
Professor, Department of Management Studies, Indian Institute of Technology Madras, Chennai, India and Associate, Mossavar Rahmani Center for Business and Government, Harvard Kennedy School, Harvard University, USA

Srivardhini K Jha
Associate Professor (Entrepreneurship), Indian Institute of Management Bangalore, Bengaluru, India

Joffi Thomas
Associate Professor (Marketing), Indian Institute of Management Kozhikode, Kozhikode, India

Rohan Chinchwadkar
Assistant Professor (Finance), Shailesh J Mehta School of Management, Indian Institute of Technology Bombay, Mumbai, India

In the new millennium, the shape of India's vibrant entrepreneurial economy has changed significantly to move towards one driven by technology and innovation. Today, India is one of the largest start-up and innovation hubs in the world, and the Indian start-up ecosystem has become an important contributor in our journey to become a $5 trillion economy.

Shifting Orbits chronicles the spectacular rise of the start-up landscape in India in four different sections: innovation, incubation, funding and industry perspectives.

- The first section dives deeper into understanding how India is faring on innovation-led entrepreneurship and delineates the challenges to be overcome.
- The next section explains how incubators provide a safe harbour for start-ups so that they can survive and flourish as viable businesses.
- For start-ups to be able to grow and create an impact, funding is critical – the third section examines the current funding scenario and lists the policy changes essential for its growth,
- The section on industry perspectives takes an analytical, practice-centred view of the growth of the Indian innovation ecosystem.

Taken together, *Shifting Orbits* is a comprehensive narrative on innovation and venturing in India and provides valuable insights on current trends and practices as well as the challenges and potential benefits for the future.

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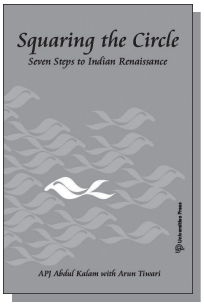
A P J Abdul Kalam
Former President of India

Arun Tiwari
Adjunct Professor, University of Hyderabad, Hyderabad, India



Dr Kalam calls for an Indian Renaissance, which he describes in seven steps involving the common people of the land, and in particular, the youth. He urges people to arise out of servitude to a vested ruling class, awake from the slumber of a passive democracy, and advance to manifest our destiny of a developed nation. He recommends that by turning inward and listening to the voice of our conscience, we can live a virtuous life and thereby build a strong and secure India.

Contents: *Prologue* ◆ *Introduction* ◆ *Acknowledgements* ◆ The Story of Socrates ◆ We Are All One ◆ Truth and Reconciliation ◆ Beyond Narrow Domestic Walls ◆ A World View is a Lens ◆ Ignited Minds ◆ Know Thyself ◆ Social Enterprise ◆ Istikhara ◆ Good to Great ◆ Re-energizing Relations ◆ Strength respects Strength ◆ Work, Bread, Water and Salt for All ◆ Livable Planet ◆ *Epilogue* ◆ *Index*

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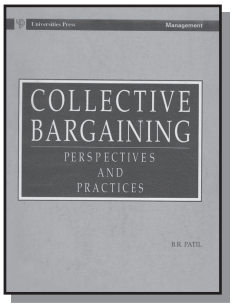
B R Patil



This book outlines the concept of collective bargaining as it has developed in many industrial countries. It does not restrict itself to the development and present status of collective bargaining in the industrialised market economies alone, but analyses its development and practice in Indian industries too.

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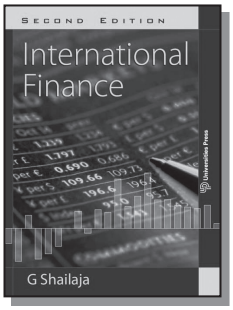

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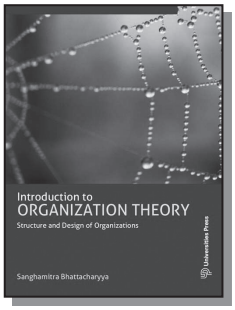

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This book explains the concept of organization theory, structure and design. The focus is on the structure and design of organizations, the theories underlying the design of structures, the effectiveness of organizational design in ensuring organizational survival and growth, and the management of organizational restructuring and change to prevent corporate decline and failure. Most standard textbooks on organizational theory currently in use are by foreign authors, and cite predominantly US or European examples. To address this lacuna, at least two Indian case studies have been discussed in each chapter and numerous examples of Indian organizations and their experiences have been included to explain concepts and theories.

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Valerie Anderson
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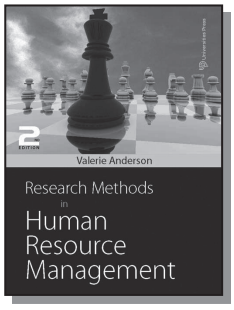

This book addresses the needs of HRM and CIPD students writing a management report or dissertation, providing both theoretical frameworks and practical guidance. Providing an accessible guide to the planning and execution of HRM research projects, this text seeks to develop the knowledge and skills of first-time researchers for effective research into HRM issues in organisations.

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