Introduction Indian Institute Of Technology Kanpur

This more-of-physics, less-of-math, insightful and comprehensive book simplifies computational fluid dynamics for readers with little knowledge or experience in heat transfer, fluid dynamics or numerical methods. The novelty of this book lies in the simplification of the level of mathematics in CFD by presenting physical law (instead of the traditional differential equations) and discrete (independent of continuous) math-based algebraic formulations. Another distinguishing feature of this book is that it effectively links theory with computer program (code). This is done with pictorial as well as detailed explanations of implementation of the numerical methodology. It also includes pedagogical aspects such as end-of-chapter problems and carefully designed examples to augment learning in CFD code-development, application and analysis. This book is a valuable resource for students in the fields of mechanical, chemical or aeronautical engineering.

The utilization of various types of biomass residue to produce products such as biofuels and biochemicals means biorefinery technology using biomass residues may become a one-stop solution to the increasing need for sustainable, non-fossil sources of energy and chemicals. Refining Biomass Residues for Sustainable Energy and Bioproducts: Technology, Advances, Life Cycle Assessment and Economics focuses on the various biorefineries currently available and discusses their uses, challenges, and future developments. This book introduces the concept of integrated biorefinery systems, as well as their operation and feedstock sourcing. It explores the specificities, current developments, and potential end products of various types of residue, from industrial and municipal to agricultural and marine, as well as residue from food industries. Sustainability issues are discussed at length, including life cycle assessment, economics, and cost analysis of different biorefinery models. In addition, a number of global case studies examine successful experiences in different regions. This book is an ideal resource for researchers and practitioners in the field of bioenergy and waste management who are looking to learn about technologies involved in residue biorefinery systems, how to reduce their environmental impacts, and how to ensure their commercial viability. Explores a range of different biorefinery categories, such as industrial, agricultural, and marine biomass residues Includes a Life Cycle Assessment of biorefinery models, in addition to costs and market analysis. Features case studies from around the world and is written by an international team of authors

The Iitians: The Story Of A Remarkable Indian Institution And How Its Alumni Are Reshaping The World Iit (Indian Institute Of Technology) Is India S Biggest And Most Powerful Brand, And Arguably The Toughest And Most Influential Engineering School In The World. Since The First Iit Was Set Up In The 1950S, Thousands Of Initiates Have Walked Out

Of The Campus Gates In Kharagpur, Mumbai, Chennai And Elsewhere To Become Leaders In Their Chosen Fields. In India They Head Many Of The Biggest And Most Admired Professionally Managed Companies. Abroad, They Lead Giant Corporations, And Their Feats Figure In The Folklore Of Silicon Valley. The Power That The Alumni Of This One Bunch Of Undergraduate Schools Wields In Business, Academe And Research Is Comparable To That Of Cambridge And Oxford In The Heyday Of The British Empire. Sandipan Deb, Himself An Iitian, Delves Into His Own Experience And Those Of Scores Of Alumni To Try And Explain What Makes Iitians Such Outstanding Achievers. In Part It May Be That They Cannot Be Anything Else: Only One In Every Hundred Applicants Gets Admitted. Harvard, In Comparison, Takes One In Eight. The Unique Village-Like Campuses Peopled Only By The Super-Bright And The Intensely Competitive Hone The Iitians Skills Further. No Wonder Then That When They Leave The Campus, Iitians Look Upon Themselves As Special People, Capable Of Competing In Their Field With The Best In The World. And, As Their Record Shows, Succeeding.

The laws of thermodynamics the science that deals with energy and its transformation have wide applicability in several branches of engineering and science. The revised edition of this introductory text for undergraduate engineering courses covers the physical concepts of thermodynamics and demonstrates the underlying principles through practical situations. The traditional classical (macroscopic) approach is used in this text. Numerous solved examples and more than 550 unsolved problems (included as chapter-end exercises) will help the reader gain confidence for applying the principles of thermodynamics in real-life problems. Sufficient data needed for solving problems have been included in the appendices.

This book presents over 100 papers from the 3rd Engineering & Product Design Education International Conference dedicated to the subject of exploring novel approaches in product design education. The theme of the book is "Crossing Design Boundaries" which reflects the editors' wish to incorporate many of the disciplines associated with, and integral to, modern product design and development pursuits. Crossing Design Boundaries covers, for example, the conjunction of anthropology and design, the psychology of design products, the application of soft computing in wearable products, and the utilisation of new media and design and how these can be best exploited within the current product design arena. The book includes discussions concerning product design education and the cross-over into other well established design disciplines such as interaction design, jewellery design, furniture design, and exhibition design which have been somewhat under represented in recent years. The book comprises a number of sections containing papers which cover highly topical and relevant issues including Design Curriculum Development, Interdisciplinarity, Design Collaboration and Team Working, Philosophies of Design Education, Design Knowledge, New Materials and New Technologies in Design, Design Communication, Industrial Collaborations and Working with Industry, Teaching and Learning Tools, and Design

Theory.

This book uses tutorials and new material to describe the basic concepts of soft-computing which potentially can be used in real-life sensor network applications. It is organized in a manner that exemplifies the use of an assortment of soft-computing applications for solving different problems in sensor networking. Written by worldwide experts, the chapters provide a balanced mixture of different problems concerning channel access, routing, coverage, localization, lifetime maximization and target tracking using emerging soft-computing applications.

Textbook on the physical principles of optical fibers - for advanced undergraduates and graduates in physics or electrical engineering.

Metallic Glass-Based Nanocomposites: Molecular Dynamics Study of Properties provides readers with an overview of the most commonly used tools for MD simulation of metallic glass composites and provides all the basic steps necessary for simulating any material on Materials Studio. After reading this book, readers will be able to model their own problems on this tool for predicting the properties of metallic glass composites. This book provides an introduction to metallic glasses with definitions and classifications, provides detailed explanations of various types of composites, reinforcements and matrices, and explores the basic mechanisms of reinforcement-MG interaction during mechanical loading. It explains various models for calculating the thermal conductivity of metallic glass composites and provides examples of molecular dynamics simulations. Aimed at students and researchers, this book caters to the needs of those working in the field of molecular dynamics (MD) simulation of metallic glass composites.

This Encyclopedia of Control Systems, Robotics, and Automation is a component of the global Encyclopedia of Life Support Systems EOLSS, which is an integrated compendium of twenty one Encyclopedias. This 22-volume set contains 240 chapters, each of size 5000-30000 words, with perspectives, applications and extensive illustrations. It is the only publication of its kind carrying state-of-the-art knowledge in the fields of Control Systems, Robotics, and Automation and is aimed, by virtue of the several applications, at the following five major target audiences: University and College Students, Educators, Professional Practitioners, Research Personnel and Policy Analysts, Managers, and Decision Makers and NGOs.

A valuable guide for new and experienced readers, featuring the complex and massive world of IoT and IoT-based solutions.

This book contains technical papers, presented in a discussion session at the XI International Conference on Soil Mechanics and Foundation Engineering held in San Francisco in 1985, on the role of centrifuge in geotechnical testing, with descriptions of test facilities.

Solar Energy Application in Buildings discusses the successful utilization of the Sun's energy in various cultures, continents, and climates. This book consists of 19 chapters and begins with considerable chapters devoted to the fundamentals of solar energy, including climate, storage, and material properties. The subsequent chapters discuss the concept of passive heating and cooling in

buildings. The remaining nine chapters deal with various applications of solar energy in buildings in the United States, Iran, Canada, Germany, Japan, New Zealand, Great Britain, India, and France. This work will be of great value to scientists and engineers who are interested in the great potential of solar energy.

This book focuses on promoting entrepreneurial ecosystems within universities and educational institutes. It especially emphasizes the thriving systems and practices existing within the Indian Institute of Technology Kanpur (IITK). It discusses cases and successes of the SIDBI Incubation and Innovation Centre in the Institute. This edited volume highlights the vision of IITK and describes a few of the major achievements of the past few years. It especially showcases the requirements and challenges of creating, sustaining, and boosting such entrepreneurial ecosystems and incubation centres. The contents of this book will be useful to researchers, administrators, and corporate collaborators working in the area of monetizing technology coming from educational institutions by converting it to successful products and business ideas.

Fluoropolymers are used in applications demanding service at enhanced temperature while maintaining their structural integrity and have excellent combination of chemical, physical and mechanical properties. Advancements in materials and processing technology mean that a huge amount of research is currently taking place into new, high performance applications for specialty fluorinated polymers. This book is a complete review of the current research in synthesizing new fluorinated high performance polymers and their application in the field of low dielectric constant materials, membrane based separation (gas and liquid) and proton exchange membranes. Special emphasis is given to the preparation of soluble high performance polymers by incorporating fluorine and different structural elements so as to use these classes of polymers in different membrane based applications, including low dielectric constant materials, gas separation, pervaporation, proton exchange membranes in fuel cells, and more. The coverage of processing properties and commercial aspects - as well as a practical assessment of the advantages and disadvantages of specialty fluoropolymers compared to other materials - enables engineers and product designers to apply the latest scientific developments in this area in a practical setting. Thorough coverage of modern applications for specialty fluorinated polymers, including membranes and coatings – giving insight into recent research and the future direction of this technology Brings researchers and engineers up to date with the latest developments in specialty fluoropolymers, to assist in future materials research and part design Includes detailed assessment of the advantages and shortcomings of specialty fluorinated polymers, for ease of comparison with alternative materials

Although there are many books on the finite element method (FEM) on the market, very few present its basic formulation in a simple, unified manner. Furthermore, many of the available texts address either only structure-related problems or only fluid or heat-flow problems, and those that explore both do so at an advanced level. Introductory Finite Element Method examines both structural analysis and flow (heat and fluid) applications in a presentation specifically designed for upper-level undergraduate and beginning graduate students, both within and outside of the engineering disciplines. It includes a chapter on variational calculus, clearly presented to show how the functionals for structural analysis and flow problems are formulated. The authors provide both one- and two-dimensional finite element codes and a wide range of examples and exercises. The exercises include some simpler ones to solve by hand calculation-this allows readers to understand the theory and assimilate the details of the steps in formulating computer implementations of the method. Anyone interested in learning to solve boundary value problems numerically deserves a straightforward and practical introduction to the powerful FEM. Its clear, simplified

presentation and attention to both flow and structural problems make Introductory Finite Element Method the ideal gateway to using the FEM in a variety of applications.

The book, now in its Fifth Edition, aims to provide a practical view of GNU/Linux and Windows 7, 8 and 10, covering different design considerations and patterns of use. The section on concepts covers fundamental principles, such as file systems, process management, memory management, input-output, resource sharing, inter-process communication (IPC), distributed computing, OS security, real-time and microkernel design. This thoroughly revised edition comes with a description of an instructional OS to support teaching of OS and also covers Android, currently the most popular OS for handheld systems. Basically, this text enables students to learn by practicing with the examples and doing exercises. NEW TO THE FIFTH EDITION • Includes the details on Windows 7, 8 and 10 • Describes an Instructional Operating System (PintOS), FEDORA and Android • The following additional material related to the book is available at www.phindia.com/bhatt. o Source Code Control System in UNIX o X-Windows in UNIX o System Administration in UNIX o VxWorks Operating System (full chapter) o OS for handheld systems, excluding Android o The student projects o Questions for practice for selected chapters TARGET AUDIENCE • BE/B.Tech (Computer Science and Engineering and Information Technology) • M.Sc. (Computer Science) BCA/MCA

Entrepreneurship is not about breaking free from the 9 to 5 humdrum, not about being your own boss, and definitely not glorious. The entrepreneur shuns the comfort of a cushy corporate job and six figure salaries to set sail on unchartered waters with a single minded zeal and only an idea as an anchor. But it is this idea and passion that makes all the difference and catapults them into a world of infinite possibilities. The Game Changers brings to you 20 success stories of IITians who went on to live the big dream. These include: Suhas Patil, Vijay Kumar, Vinod Gupta, Sam Dalal, Sridhar Mitta, Arjun Malhotra, Kiran Seth, Prabhakant Sinha, Ranbir Singh Gupta, Bikram Dasgupta founder of Globsyn, Praful Kulkarni, Sunil Gaitonde, Anand Deshpande, Arvind Kejriwal, Harish Hande, Anuradha Acharya, Venkata Subramanian, Bikash Barai, Vikram Kumar, and Krishna Mehra. With a foreword by Dr Duvvuri Subbarao, Governor, Reserve Bank of India, and introduction by Damodar Acharya, Director, IIT Karagpur, this book marks the 60 golden years of India's finest institute. Come, be a part of their journey, get inspired to dream and make your own story.

Complex raw materials and manufacturing processes mean the textile industry is particularly dependent on good process control to produce high and consistent product quality. Monitoring and controlling process variables during the textile manufacturing process also minimises waste, costs and environmental impact. Process control in textile manufacturing provides an important overview of the fundamentals and applications of process control methods. Part one introduces key issues associated with process control and principles of control systems in textile manufacturing. Testing and statistical quality control are also discussed before part two goes on to consider control in fibre production and yarn manufacture. Chapters review process and quality control in natural and synthetic textile fibre cultivation, blowroom, carding, drawing and combing. Process control in ring and rotor spinning and maintenance of yarn spinning machines are also discussed. Finally part three explores process control in the manufacture of knitted, woven, nonwoven textiles and colouration and finishing, with a final discussion of process control in apparel manufacturing. With its distinguished editors and international team of expert contributors, Process control in textile manufacturing is an essential guide for textile engineers and manufacturers involved in the processing of textiles, as well as academic researchers in this field. Provides an important overview of the fundamentals and applications of process control methods Discusses key issues associated with process control and principles of control systems in textile manufacturing, before addressing testing and statistical quality control Explores process control in the manufacture of knitted, woven, nonwoven textiles and colouration and finishing, with a

discussion on process control in apparel manufacturing

Three Phase Partitioning: Applications in Separation and Purification of Biological Molecules and Natural Products presents applications in diverse areas of both chemical technology and biotechnology. This book serves as a single resource for learning about both the economical, facile and scalable processes, along with their potential for applications in the separation and purification of materials and compounds across the entire spectra of chemical and biological nature. The book begins by explaining the origins and fundamentals of TPP and continues with chapters on related applications, ranging from the purification of parasite recombinant proteases to oil extraction from oilseeds and oleaginous microbes, and more. Written by researchers who have been pioneers in developing and utilizing three phase partitioning Focuses on applications, with chapters detailing relevance to a wide variety of areas and numerous practical examples Designed to give laboratory workers the information needed to undertake the challenge of designing successful three-phase partitioning protocols

A broad coverage of basic & applied research projects dealing with the application of engineering principles to both food production & processing. Land and water use; Agricultural buildings; Agricultural mechanisation; Power & processing; Management & ergonomics. About 450 papers from over 50 countries worlwide.

Similar to the way in which computer vision and computer graphics act as the dual fields that connect image processing in modern computer science, the field of image processing can be considered a crucial middle road between the vision and graphics fields. Research Developments in Computer Vision and Image Processing: Methodologies and Applications brings together various research methodologies and trends in emerging areas of application of computer vision and image processing. This book is useful for students, researchers, scientists, and engineers interested in the research developments of this rapidly growing field.

Provides a broad and accessible introduction to the field of aerospace engineering, ideal for semester-long courses Aerospace engineering, the field of engineering focused on the development of aircraft and spacecraft, is taught at universities in both dedicated aerospace engineering programs as well as in wider mechanical engineering curriculums around the world-yet accessible introductory textbooks covering all essential areas of the subject are rare. Filling this significant gap in the market, Introduction to Aerospace Engineering: Basic Principles of Flight provides beginning students with a strong foundational knowledge of the key concepts they will further explore as they advance through their studies. Designed to align with the curriculum of a single-semester course, this comprehensive textbook offers a student-friendly presentation that combines the theoretical and practical aspects of aerospace engineering. Clear and concise chapters cover the laws of aerodynamics, pressure, and atmospheric modeling, aircraft configurations, the forces of flight, stability and control, rockets, propulsion, and more. Detailed illustrations, well-defined equations, end-of-chapter summaries, and ample review questions throughout the text ensure students understand the core topics of aerodynamics, propulsion, flight mechanics, and aircraft performance. Drawn from the author's thirty years' experience teaching the subject to countless numbers of university students, this much-needed textbook: Explains basic vocabulary and fundamental aerodynamic concepts Describes aircraft configurations, low-speed aerofoils, high-lift devices, and rockets Covers essential topics including thrust, propulsion, performance, maneuvers, and stability and control Introduces each topic in a concise and straightforward manner as students are guided through progressively more advanced material Includes access to companion website containing a solutions manual and lecture slides for instructors Introduction to Aerospace Engineering: Basic Principles of Flight is the perfect "one stop" textbook for instructors, undergraduates, and graduate students in Introduction to Aerospace Engineering or Introduction to Flight courses in Aerospace Engineering or Mechanical Engineering programs.

Over the past twenty years, Catalysis by Heteropolyacids (HPAs) has received wide attention and led to new and promising developments both at academic and industrial level. In particular, heterogeneous catalysis is particularly attractive because it generally satisfies most of green chemistry's requirements. By emphasizing the development of third generation catalysts, this volume presents trends and opportunities in academic and industrial research. The book appeals to postgraduates, researchers, and chemists working in the field of environmentally benign catalysts as well as catalytic processes.

An Eye For Excellence Is An Inspiring Chronicle Of How A Newly Established Institution The Indian Institute Of Technology, Kanpur Achieved Pre-Eminence In A Short Period Of Time, And How Today, As It Completes Fifty Years, It Is Poised For A Quantum Leap In Its Journey Of Excellence. Blessed With The Support Of India'S First Prime Minister, Jawaharlal Nehru, And Lucky To Have A Visionary Founder-Director, Dr P. K. Kelkar, Iit Kanpur Was Able To Draw On The Rich Experience Of Nine Famous Us Universities, Backed By Us Government Funds. Breaking Loose From Established Educational Patterns Both In India And Abroad, Iit Kanpur Went In For An Innovative Broad-Based Curriculum With Sciences And Humanities And Social Sciences Forming An Essential Component. It Also Introduced In India The Concepts Of The Semester System, A Continuous Evaluation Of Students And Letter Grades. An Open, Participatory Ambience Transformed The Students, Representing The Cream Of India, Into Firebrands With A Midas Touch. They Went On To Make A Name For Themselves, Their Alma Mater And Their Country Across A Wide Spectrum, Even Beyond Their Fields Of Specialization. From An Important Discovery About Prime Numbers(By Maninder Agarwal), To Rising To Be The Head Of The Reserve Bank Of India (Duvvuri Subbarao), To Selfless Public Service (Satyendra Dubey), To Becoming Icons Of Environment (Anil Agarwal) And Entrepreneurship(N.R. Narayana Murthy In India And Umang Gupta In Silicon Valley), The Students Of Iit Kanpur Have Shown Extraordinary Versatility. What Gave The Faculty, The Students And Staff A Deep Sense Of 'Ownership' Of The Institute Was The Fact That They Pioneered A Large Number Of Exceptional Activities, Whether In Computers Or Materials Science Education Or A Student-Operated Television Studio. How The Institute Overcame The Hurdles In Its Path Is A Heart-Warming Saga In Itself. Today, As Iit Kanpur Continues On Its Dynamic Path, It Is Exhilarating To Know That Such 'Nalandas' Can Indeed Be Built And Sustained In Modern India.

This work describes an experimental investigation with the aim to evaluate and establish wire spark erosion machining (WSEM) as a viable alternative for high quality miniature gear manufacturing. External spur type miniature brass (ASTM 858) gears with 12 teeth, 9.8 mm outside diameter and 5 mm face width were manufactured by WSEM. The research work was accomplished in four distinct experimental stages viz., preliminary, pilot, main and confirmation. The aim, scope and findings of each stage are progressively presented and discussed. In essence, the investigation found that it was possible to manufacture miniature gears to high quality by using WSEM. Gears up to DIN 5 quality with a good surface finish (1.2 ?m average roughness) and satisfactory surface integrity were achieved. The results suggest that WSEM should be considered a viable alternative to conventional miniature gear manufacturing techniques and that in some instances it may even be superior. This work will prove useful to researchers and professionals in the field of miniature and micro-scale manufacturing and machining.

The fields of computer vision and image processing are constantly evolving as new research and applications in these areas emerge. Staying abreast of the most up-to-date developments in this field is necessary in order to promote further research and apply these developments in real-world settings. Computer Vision: Concepts, Methodologies, Tools, and Applications is an innovative reference source for the latest academic material on development of computers for gaining understanding about videos and digital images. Highlighting a range of topics, such as computational models, machine learning, and image processing, this multi-volume book is ideally designed for academicians,

technology professionals, students, and researchers interested in uncovering the latest innovations in the field.

It is with great pleasure that we welcome you to the inaugural World Congress on Engineering Asset Management (WCEAM) being held at the Conrad Jupiters Hotel on the Gold Coast from July 11 to 14, 2006. More than 170 authors from 28 countries have contributed over 160 papers to be presented over the first three days of the conference. Day four will be host to a series of workshops devoted to the practice of various aspects of Engineering Asset Management. WCEAM is a new annual global forum on the various multidisciplinary aspects of Engineering Asset Management. It deals with the presentation and publication of outputs of research and development activities as well as the application of knowledge in the practical aspects of: strategic asset management risk management in asset management design and life-cycle integrity of physical assets asset performance and level of service models financial analysis methods for physical assets reliability modelling and prognostics information systems and knowledge management asset data management, warehousing and mining condition monitoring and intelligent maintenance intelligent sensors and devices regulations and standards in asset management human dimensions in integrated asset management education and training in asset management and performance management in asset management. We have attracted academics, practitioners and scientists from around the world to share their knowledge in this important emerging transdiscipline that impacts on almost every aspect of daily life.

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