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The Architecture of Natural Cooling - Brian Ford 2019-11-15

Overheating in buildings is commonplace. This book describes how we can keep cool without conventional air-conditioning: improving comfort and productivity while reducing energy costs and carbon emissions. It provides architects, engineers and policy makers with a 'how-to' guide to the application of natural cooling in new and existing buildings. It demonstrates, through reference to numerous examples, that natural cooling is viable in most climates around the world. This completely revised and expanded second edition includes: An overview of natural cooling past and present. Guidance on the principles and strategies that can be adopted. A review of the applicability of different strategies. Explanation of simplified tools for performance assessment. A review of components and controls. A detailed evaluation of case studies from the USA, Europe, India and China. This book is not just for the technical specialist, as it also provides a general grounding in how to avoid or minimise air-conditioning. Importantly, it demonstrates that understanding our environment, rather than fighting it, will help us to live sustainably in our rapidly warming world.

Solar Energy in Buildings - Dorota Chwieduk 2014-06-19

Solar Energy in Buildings presents solar radiation fundamentals and their applications in buildings, supported by theoretical analysis and results of original simulation studies in solar energy availability, collection, and conversion for both active and passive use. In-depth coverage of energy balance and heat transfer in building envelopes is supported by the inclusion of calculations and case studies, while contextualizing within an integrated design approach. Explains the best uses of cutting-edge advances such as concentrated solar thermal, thermoelectric and polymetric materials Covers active and passive solar collection and conversion systems Provides energy balance calculations and case studies deriving from real installations connect theory and practice

Efficient Buildings 2 - J. Trost 1990

The intention of this book is to develop an understanding of the things we build, how they are created, and how they affect our lives. Photos and line drawings.

Modeling, Design, and Optimization of Net-Zero Energy Buildings - Andreas Athienitis 2015-01-26

Building energy design is currently going through a period of major changes. One key factor of this is the adoption of net-zero energy as a long term goal for new buildings in most developed countries. To achieve this goal a lot of research is needed to accumulate knowledge and to utilize it in practical applications. In this book, accomplished international experts present advanced modeling techniques as well as in-depth case studies in order to aid designers in optimally using simulation tools for net-zero energy building design. The strategies and technologies discussed in this book are, however, also applicable for the design of energy-plus buildings. This book was facilitated by International Energy Agency's Solar Heating and Cooling (SHC) Programs and the Energy in Buildings and Communities (EBC) Programs through the joint SHC Task 40/EBC Annex 52: Towards Net Zero Energy Solar Buildings R&D collaboration. After presenting the fundamental concepts, design strategies, and technologies required to achieve net-zero energy in buildings, the book discusses different design processes and tools to support the design of net-zero energy

buildings (NZEBS). A substantial chapter reports on four diverse NZEBs that have been operating for at least two years. These case studies are extremely high quality because they all have high resolution measured data and the authors were intimately involved in all of them from conception to operating. By comparing the projections made using the respective design tools with the actual performance data, successful (and unsuccessful) design techniques and processes, design and simulation tools, and technologies are identified. Written by both academics and practitioners (building designers) and by North Americans as well as Europeans, this book provides a very broad perspective. It includes a detailed description of design processes and a list of appropriate tools for each design phase, plus methods for parametric analysis and mathematical optimization. It is a guideline for building designers that draws from both the profound theoretical background and the vast practical experience of the authors.

Ground-source Heat Pumps - Stephen P. Kavanaugh 1997

Thermal Design of Buildings - Phillip Jones 2021-07

The way we heat, cool and ventilate our buildings is central to many of today's concerns, including providing comfortable, healthy and productive environments, using energy and materials efficiently, and reducing greenhouse gas emissions. As we drive towards a zero-carbon society, design solutions that combine architecture, engineering and the needs of the individual are increasingly being sought. Thermal Design of Buildings aims to provide an understanding from which such solutions can be developed, placing technological developments within the context of a wider world view of the built environment and energy systems, and an historical perspective of how buildings have responded to climate and sustainable development.

Heat Pumps for Sustainable Heating and Cooling - Y. H. Venus Lun 2019-11-13

This book highlights the significance of using sustainable energy to prevent the deterioration of our planet using heat pumps. Energy sustainability can be achieved through improved energy efficiency. In this regard, heat pumps offer an energy-efficient alternative for heating and cooling. To drive the adoption of heat pumps as a key component of sustainable buildings, the authors focus on examining sustainable practices in heat pump operations and innovative system design. In view of the growing desire to use sustainable energy to meet heating and cooling demands and improve indoor air quality, this book offers a valuable reference guide to the available options in HVAC (heating, ventilation, and air-conditioning) system design. To begin with, the authors define sustainable energy and discuss the trend of "thinking green" in building design. They then discuss sustainable practices and heat pump applications in mapping out HVAC systems. In turn, they examine the use of green operations to promote sustainable practices and, in order to highlight the importance of innovative design, discuss the configuration options and precision control aspects. In closing, the authors illustrate innovative sustainable design on the basis of several energy-efficient cases. The book's main goal is to drive the adoption of sustainable energy solutions. Heat pumps, it argues, represent the most efficient system for meeting commercial/recreational/residential heating and cooling demands. The book not only examines industrial practices in heat pump application,

but also discusses advanced heat pump technologies and innovative heat pump designs.

Heating, Cooling, Lighting - Norbert M. Lechner 2021-10-26

The essential guide to environmental control systems in building design For over 25 years Heating, Cooling, Lighting: Sustainable Design Strategies Towards Net Zero Architecture has provided architects and design professionals the knowledge and tools required to design a sustainable built environment at the schematic design stage. This Fifth Edition offers cutting-edge research in the field of sustainable architecture and design and has been completely restructured based on net zero design strategies. Reflecting the latest developments in codes, standards, and rating systems for energy efficiency, Heating, Cooling, Lighting: Sustainable Design Strategies Towards Net Zero Architecture includes three new chapters: Retrofits: Best practices for efficient energy optimization in existing buildings Integrated Design: Strategies for synergizing passive and active design Design Tools: How to utilize the best tools to benchmark a building's sustainability and net zero potential Heating, Cooling, Lighting: Sustainable Design Strategies Towards Net Zero Architecture is a go-to resource for practicing professionals and students in the fields of environmental systems technology or design, environmental design systems, construction technology, and sustainability technology.

Handbook of Heating, Ventilation, and Air Conditioning - Jan F. Kreider 2000-12-26

Over the past 20 years, energy conservation imperatives, the use of computer based design aids, and major advances in intelligent management systems for buildings have transformed the design and operation of comfort systems for buildings. The "rules of thumb" used by designers in the 1970s are no longer viable. Today, building systems engineers must have a strong analytical basis for design synthesis processes. But how can you develop this basis? Do you have on your shelf a reference that describes all the latest methods? Does it cover everything from the fundamentals to state-of-the-art, intelligent systems? Does it do so in a practical way that you can easily access and use when you need to? The Handbook of Heating, Ventilation, and Air Conditioning does. It combines practice and theory, systems and control, and the latest methods and technologies to provide, in one volume, all of the modern design and operation information needed by HVAC engineers. The Handbook of Heating, Ventilation, and Air Conditioning will stay up-to-date while other resources become outmoded and go through lengthy revision and reprint processes. Through a link on the CRC Web site, owners of the Handbook can access new material periodically posted by the author.

Solar Heating and Cooling - Frank Kreith 1982

Discusses solar-energy concepts and requirements and the principles of heat transfer and details the designs and operation of economically feasible systems for heating and air-conditioning buildings

Solar Heating and Cooling of Residential Buildings - Colorado State University. Solar Energy Applications Laboratory 1977

Energy Conservation in New Building Design - American Society of Heating, Refrigerating and Air-Conditioning Engineers 1975

Heating and Cooling of Buildings - T. Agami Reddy 2016-09-01

Heating and Cooling of Buildings: Principles and Practice of Energy Efficient Design, Third Edition is structured to provide a rigorous and comprehensive technical foundation and coverage to all the various elements inherent in the design of energy efficient and green buildings. Along with numerous new and revised examples, design case studies, and homework problems, the third edition includes the HCB software along with its extensive website material, which contains a wealth of data to support design analysis and planning. Based around current codes and standards, the Third Edition explores the latest technologies that are central to design and operation of today's buildings. It serves as an up-to-date technical resource for future designers, practitioners, and researchers wishing to acquire a firm scientific foundation for improving the design and performance of buildings and the comfort of their occupants. For engineering and architecture students in undergraduate/graduate classes, this comprehensive textbook: *Handbook of Energy Systems in Green Buildings* - Ruzhu Wang 2018-10-15 This handbook provides a comprehensive summary on the energy systems used in green buildings, with a

particular focus on solar energy - the most common renewable energy source applied in this field. With the growing concern about environmental protections, the concepts of green building have been widely promoted and implemented in nowadays building designs and constructions. Among all, sustainable energy systems, including energy harvesting, conversion, and storage, is one of the most important design factors in green buildings. Unlike traditional energy systems which highly rely on fossil fuel, green buildings utilize renewable energy source or high efficient energy systems, or both, to provide environmental friendly, low carbon waste energy. The most updated concepts, designs, technologies developed and implemented in heat pumps, cooling systems, power systems, and energy storage will be discussed here in details. This handbook is subdivided into 7-9 main sections to provide an in-depth discussion from foundational principles to practical techniques. In addition, different cases about green energy systems implemented in global will be discussed. The book will be structured easy-to-read, to make it more accessible to graduate students and professionals in diverse scientific and engineering communities, including applied physics, civil engineering, electrical engineering, mechanical engineering, material engineering, and chemical engineering.

Heating, Cooling, Lighting - Norbert Lechner 1991-01-16

Using a qualitative rather than a quantitative approach, presents detailed information based on concepts, rules, guidelines, intuition, and experience for architects in the areas of heating, cooling, and lighting at the schematic design stage. The data explored supports a three-tiered approach--load avoidance, using natural energy sources, and mechanical equipment. Among the topics covered are shading, thermal envelope, passive heating and cooling, electric lighting, and HVAC. Case studies illustrate how certain buildings use techniques at all three tiers for heating, cooling, and lighting. An appendix lists some of the more appropriate computer programs available to the architect for analysis at the schematic design stage.

Thermally Active Surfaces in Architecture - Kiel Moe 2010-03-15

Departing from the simple question Why do we heat and cool buildings with air?, this book focuses on the technique of thermally active surfaces. This technique uses water in building surfaces to heat and cool bodies - a method that is at once more efficient, comfortable, and healthy. This technique thus imbues the fabric of the building with a more poignant role: its structure is also its primary heating and cooling system. In doing so, this approach triggers a cascading set of possibilities for how well buildings are built, how well they perform, and how long they will last: pointing the way toward multiple forms of sustainability. The first section of the book contrasts the parallel histories of thermally active surfaces and air conditioning. These histories explain the material, social, marketing, and technical unfolding of building technology in the twentieth century as a means to explain why we build the way we do and why that will change in the new century. The next section of the book covers the physiological and thermodynamic basis of thermally active surfaces. This section is designed for engineers and architects to grasp the logic and advantages of this technique. This section also includes a chapter on the de-fragmentation of buildings and design practice that is inherent in building with thermally active surfaces. The final section covers a series of contemporary case studies that demonstrate the efficacy of this technique. The project list currently includes Kunsthau in Bregenz by Peter Zumthor, Zollverein School of Management in Essen, Germany by SANAA, and Linked Hybrid in Beijing by Steven Holl, amongst others.

Passive Building Design - N. K. Bansal 1994

Hardbound. The concepts, elements and design patterns of passive buildings are dealt with in this book. These patterns are a way to conserve energy in buildings or to provide more comfortable conditions inside the space through natural means. A systematic approach has been used in the presentation of the various concepts and elements of heating, cooling, combined heating and cooling, humidity control and daylighting. This has been achieved by describing the basic principles, their design aspects and performance, and illustrating with appropriate examples. The subject is covered in a compact yet comprehensive way. The information presented in the main text is supplemented by very useful appendices, which also include some case studies of passive buildings from all over the world.

Low Energy Cooling for Sustainable Buildings - Ursula Eicker 2009-03-23

This long-awaited reference guide provides a complete overview of low energy cooling systems for buildings, covering a wide range of existing and emerging sustainable energy technologies in one

comprehensive volume. An excellent data source on cooling performance, such as building loads or solar thermal chiller efficiencies, it is essential reading for building services and renewable energy engineers and researchers covering sustainable design. The book is unique in including a large set of experimental results from years of monitoring actual building and energy plants, as well as detailed laboratory and simulation analyses. These demonstrate which systems really work in buildings, what the real costs are and how operation can be optimized – crucial information for planners, builders and architects to gain confidence in applying new technologies in the building sector. Inside you will find valuable insights into: the energy demand of residential and office buildings; facades and summer performance of buildings; passive cooling strategies; geothermal cooling; active thermal cooling technologies, including absorption cooling, desiccant cooling and new developments in low power chillers; sustainable building operation using simulation. Supporting case study material makes this a useful text for senior undergraduate students on renewable and sustainable energy courses. Practical and informative, it is the best up-to-date volume on the important and rapidly growing area of cooling.

Advanced Energy Design Guide for Small Office Buildings - American Society of Heating, Refrigerating and Air-Conditioning Engineers 2004

"Achieving 30% energy savings over ANSI/ASHRAE/IESNA standard 90.1-1999."

Analysis and Design of Heating, Ventilating, and Air-Conditioning Systems, Second Edition - Herbert W. Stanford III 2019-04-01

Analysis and Design of Heating, Ventilating, and Air-Conditioning Systems, Second Edition, provides a thorough and modern overview of HVAC for commercial and industrial buildings, emphasizing energy efficiency. This text combines coverage of heating and air conditioning systems design with detailed information on the latest controls technologies. It also addresses the art of HVAC design along with carefully explained scientific and technical content, reflecting the extensive experience of the authors. Modern HVAC topics are addressed, including sustainability, IAQ, water treatment and risk management, vibration and noise mitigation, and maintainability from a practical point of view.

Thermal Design of Buildings - Phillip Jones 2021-07-26

The way we heat, cool and ventilate our buildings is central to many of today's concerns, including providing comfortable, healthy and productive environments, using energy and materials efficiently, and reducing greenhouse gas emissions. As we drive towards a zero-carbon society, design solutions that combine architecture, engineering and the needs of the individual are increasingly being sought. *Thermal Design of Buildings* aims to provide an understanding from which such solutions can be developed, placing technological developments within the context of a wider world view of the built environment and energy systems, and an historical perspective of how buildings have responded to climate and sustainable development.

Passive Low Energy Cooling of Buildings - Baruch Givoni 1994-07-27

A practical sourcebook for building designers, providing comprehensive discussion of the impact of basic architectural choices on cooling efficiency, including the layout and orientation of the structure, window size and shading, exterior color, and even the use of plantings around the site. All major varieties of passive cooling systems are presented, with extensive analysis of performance in different types of buildings and in different climates: ventilation; radiant cooling; evaporative cooling; soil cooling; and cooling of outdoor spaces.

Heating, Cooling, Lighting - Norbert Lechner 2014-10-13

Sustainable environmental control through building design *Heating, Cooling, and Lighting* is the industry standard text on environmental control systems with the emphasis on sustainable design. By detailing the many factors that contribute to the comfort in a building, this book helps architects minimize mechanical systems and energy usage over the life of the building by siting, building design, and landscaping to maximize natural heating, cooling, and lighting. This new fourth edition includes new information on integrated design strategies and designing for the Tropics. Resources include helpful case studies, checklists, diagrams, and a companion website featuring additional cases, an image bank, and instructor materials. Designing buildings that require less energy to heat, cool, and light means allowing the natural energy of the sun and wind to reduce the burden on the mechanical and electrical systems. Basic design

decisions regarding size, orientation, and form have a great impact on the sustainability, cost, and comfort of a building. *Heating, Cooling, and Lighting* provides detailed guidance for each phase of a design project. Readers will: Understand the concept of sustainability as applied to energy sources Review the basic principles of thermal comfort, and the critical role of climate Learn the fundamentals of solar responsive design, including active and passive solar systems as well as photovoltaics Discover how siting, architectural design, and landscaping can reduce the requirements for mechanical and electrical systems In sustainable design, mechanical, and electrical systems should be used to only accomplish what the architect could not by the design of the building itself. With this in mind, designers require a comprehensive understanding of both the properties of energy and the human factors involved in thermal comfort. *Heating, Cooling, and Lighting* is the complete, industry-leading resource for designers interested in sustainable environmental control.

Exergy Analysis and Thermoeconomics of Buildings - Jose M Sala-Lizarraga 2019-10-01

Quantifying exergy losses in the energy supply system of buildings reveals the potential for energy improvement, which cannot be discovered using conventional energy analysis. Thermoeconomics combines economic and thermodynamic analysis by applying the concept of cost (an economic concept) to exergy, as exergy is a thermodynamic property fit for this purpose, in that it combines the quantity of energy with its quality factor. *Exergy Analysis and Thermoeconomics of Buildings* applies exergy analysis methods and thermoeconomics to the built environment. The mechanisms of heat transfer throughout the envelope of buildings are analyzed from an exergy perspective and then to the building thermal installations, analyzing the different components, such as condensing boilers, absorption refrigerators, microgeneration plants, etc., including solar installations and finally the thermal facilities as a whole. A detailed analysis of the cost formation process is presented, which has its physical roots firmly planted in the second law of thermodynamics. The basic principles and the rules of cost allocation, in energy units (exergy cost), in monetary units (exergoeconomic cost), and in CO2 emissions (exergoenvironmental cost), based on the so-called Exergy Cost Theory are presented and applied to thermal installations of buildings. Clear and rigorous in its exposition, *Exergy Analysis and Thermoeconomics of Buildings* discusses exergy analysis and thermoeconomics and the role they could play in the analysis and design of building components, either the envelope or the thermal facilities, as well as the diagnosis of thermal installations. This book moves progressively from introducing the basic concepts to applying them. *Exergy Analysis and Thermoeconomics of Buildings* provides examples of specific cases throughout this book. These cases include real data, so that the results obtained are useful to interpret the inefficiencies and losses that truly occur in actual installations; hence, the assessment of their effects encourages the manner to improve efficiency. Applies exergy analysis methods for the installation of building thermal facilities equipment components, including pipes, valves, heat exchangers, boilers and heat pumps Helps readers determine the operational costs of heating and cooling building systems Includes exergy analysis methods that are devoted to absorption refrigerators, adsorption cooling systems, basic air conditioning processes, ventilation systems and solar systems, either thermal and PV Discusses the direct application of exergy analysis concepts, including examples of buildings with typical heating, DHW and air conditioning installations

Heating and Cooling of Buildings - T. Agami Reddy 2016-09-01

Heating and Cooling of Buildings: Principles and Practice of Energy Efficient Design, Third Edition is structured to provide a rigorous and comprehensive technical foundation and coverage to all the various elements inherent in the design of energy efficient and green buildings. Along with numerous new and revised examples, design case studies, and homework problems, the third edition includes the HCB software along with its extensive website material, which contains a wealth of data to support design analysis and planning. Based around current codes and standards, the Third Edition explores the latest technologies that are central to design and operation of today's buildings. It serves as an up-to-date technical resource for future designers, practitioners, and researchers wishing to acquire a firm scientific foundation for improving the design and performance of buildings and the comfort of their occupants. For engineering and architecture students in undergraduate/graduate classes, this comprehensive textbook: *Solar Heating and Cooling of Residential Buildings* - 1980

Heating and Cooling of Buildings - T. Agami Reddy 2016

Principles of Heating, Ventilation, and Air Conditioning in Buildings - John W. Mitchell 2012-03-06
Heating Ventilation and Air Conditioning by J. W. Mitchell and J. E. Braun provides foundational knowledge for the behavior and analysis of HVAC systems and related devices. The emphasis of this text is on the application of engineering principles that features tight integration of physical descriptions with a software program that allows performance to be directly calculated, with results that provide insight into actual behavior. Furthermore, the text offers more examples, end-of-chapter problems, and design projects that represent situations an engineer might face in practice and are selected to illustrate the complex and integrated nature of an HVAC system or piece of equipment.

Building Heat Transfer - Morris Grenfell Davies 2004-06-25

A third or more of the energy consumption of industrialized countries is expended on creating acceptable thermal and lighting conditions in buildings. As a result, building heat transfer is keenly important to the design of buildings, and the resulting analytical theory forms the basis of most design procedures.

Analytical Theory of Building Heat Transfer is the first comprehensive reference of its kind, a one-volume compilation of current findings on heat transfer relating to the thermal behavior of buildings, forming a logical basis for current design procedures.

Solar Heating and Cooling of Residential Buildings - En Solar Energy Applications Laboratory 2005

This manual was prepared primarily for use in conducting a practical training course on the design of solar heating and cooling systems for residential and small office buildings, but may also be useful as a general reference text. Only active solar systems are described in this manual. Other books are available for passive designs. Liquid and air-heating solar systems for combined space and service water heating or service water heating only are included in this manual. Furthermore, only systems with proven experience are discussed to any extent. This manual was developed by the staff of the Solar Energy Applications Laboratory and vocational education specialists at Colorado State University in cooperation with the NAHB Research Foundation. A national advisory committee selected from various sectors of the home-building industry, university sources, private practice, and government, was established to provide advice and general guidance.

Simplified Design of HVAC Systems - William Bobenhausen 1994-04-14

A practical overview of what to consider when designing a building's heating, cooling, ventilating and humidifying systems along with their space, power, control and other requirements. Includes the latest concepts, applications, basic design problems and their solutions. Packed with examples to facilitate understanding.

Heating and Cooling of Buildings - Jan F. Kreider 2002

Heating and Cooling of Buildings, Second Edition by Kreider and Rable covers technologies-from materials to computers-that are exerting a profound effect on the design and operation of buildings. Numerous examples are presented and solved to reinforce important concepts and software applications are integrated throughout. The contents of this edition have been expanded to include a chapter on economic analysis and optimization, new heating and cooling load procedures, more than 200 new homework problems, and new and simplified procedures for ground coupling heat transfer calculations. One of the most notable differences in the second edition of this book is that many of the appendices from the first edition of this book have been moved to the accompanying CD-ROM. The CD-ROM amounts to a searchable database of tables, charts, and information on building codes. For example, there are more than 1,000 tables in the electronic appendices that can be searched by major categories, a table list, or an index of topics. The CD also directs students to the central web site where several hundred links are maintained to help students find manufacturer and government data, browse in newsgroups, and find any corrections and updates to the text and data tables. Students have come to expect this kind of interaction through Internet searches.

Heating, Ventilating, and Air Conditioning - Faye C. McQuiston 2004-08-06

HEATING, VENTILATING, AND AIR CONDITIONING Completely revised with the latest HVAC design practices! Based on the most recent standards from ASHRAE, this Sixth Edition provides complete and up-

to-date coverage of all aspects of heating, ventilation, and air conditioning. You'll find the latest load calculation procedures, indoor air quality procedures, and issues related to ozone depletion. Throughout the text, numerous worked examples clearly show you how to apply the concepts in realistic scenarios. In addition, several computer programs (several new to this edition) help you understand key concepts and allow you to simulate various scenarios, such as psychometrics and air quality, load calculations, piping system design, duct system design, and cooling coil simulation. Additionally, the load calculation program has been revised and updated. These computer programs are available at the book's website: www.wiley.com/college/mcquiston Key Features of the Sixth Edition Additional new worked examples in the text and on the accompanying software. Chapters 6-9 have been extensively revised for clarity and ease of use. Chapter 8, The Cooling Load, now includes two approaches: the heat balance method, as recommended by ASHRAE, and the simpler RTS method. Both approaches include computer applications to aid in calculations. Provides complete, authoritative treatment of all aspects of HVAC, based on current ASHRAE standards. Numerous worked examples and homework problems provide realistic scenarios to apply concepts.

Modern Architecture and Climate - Daniel A. Barber 2023-04-11

How climate influenced the design strategies of modernist architects Modern Architecture and Climate explores how leading architects of the twentieth century incorporated climate-mediating strategies into their designs, and shows how regional approaches to climate adaptability were essential to the development of modern architecture. Focusing on the period surrounding World War II—before fossil-fuel powered air-conditioning became widely available—Daniel Barber brings to light a vibrant and dynamic architectural discussion involving design, materials, and shading systems as means of interior climate control. He looks at projects by well-known architects such as Richard Neutra, Le Corbusier, Lúcio Costa, Mies van der Rohe, and Skidmore, Owings, and Merrill, and the work of climate-focused architects such as MMM Roberto, Olgyay and Olgyay, and Cliff May. Drawing on the editorial projects of James Marston Fitch, Elizabeth Gordon, and others, he demonstrates how images and diagrams produced by architects helped conceptualize climate knowledge, alongside the work of meteorologists, physicists, engineers, and social scientists. Barber describes how this novel type of environmental media catalyzed new ways of thinking about climate and architectural design. Extensively illustrated with archival material, Modern Architecture and Climate provides global perspectives on modern architecture and its evolving relationship with a changing climate, showcasing designs from Latin America, Europe, the United States, the Middle East, and Africa. This timely and important book reconciles the cultural dynamism of architecture with the material realities of ever-increasing carbon emissions from the mechanical cooling systems of buildings and offers a historical foundation for today's zero-carbon design.

Solar Radiation Considerations in Building Planning and Design - National Research Council (U.S.).

Committee on Solar Energy in the Heating and Cooling of Buildings 1976

Advanced Decision Making for HVAC Engineers - Javad Khazaii 2016-08-10

This book focuses on some of the most energy-consuming HVAC systems; illuminating huge opportunities for energy savings in buildings that operate with these systems. The main discussion is on cutting-edge decision making approaches, and algorithms in: decision making under uncertainty, genetic algorithms, fuzzy logic, artificial neural networks, agent based modeling, and game theory. These methods are applied to HVAC systems, in order to help designers select the best options among the many available pathways for designing and the building of HVAC systems and applications. The discussion further evolves to depict how the buildings of the future can incorporate these advanced decision-making algorithms to become autonomous and truly 'smart'.

Passive Solar Architecture - David Bainbridge 2011-08-18

New buildings can be designed to be solar oriented, naturally heated and cooled, naturally lit and ventilated, and made with renewable, sustainable materials—no matter the location or climate. In this comprehensive overview of passive solar design, two of America's solar pioneers give homeowners, architects, designers, and builders the keys to successfully harnessing the sun and maximizing climate resources for heating, cooling, ventilation, and daylighting. Bainbridge and Haggard draw upon examples

from their own experiences, as well as those of others, of more than three decades to offer both overarching principles as well as the details and formulas needed to successfully design a more comfortable, healthy, and secure place in which to live, laugh, dance, and be comfortable. Even if the power goes off. Passive Solar Architecture also discusses “greener” and more-sustainable building materials and how to use them, and explores the historical roots of green design that have made possible buildings that produce more energy and other resources than they use.

Mechanical and Electrical Equipment for Buildings - Walter T. Grondzik 2019-09-10

The definitive guide to the design of environmental control systems for buildings—now updated in its 13th Edition *Mechanical and Electrical Equipment for Buildings* is the most widely used text on the design of environmental control systems for buildings—helping students of architecture, architectural engineering, and construction understand what they need to know about building systems and controlling a building's environment. With over 2,200 drawings and photographs, this 13th Edition covers basic theory, preliminary building design guidelines, and detailed design procedure for buildings of all sizes. It also provides information on the latest technologies, emerging design trends, and updated codes. Presented in nine parts, *Mechanical and Electrical Equipment for Buildings*, Thirteenth Edition offers readers comprehensive coverage of: environmental resources; air quality; thermal, visual, and acoustic comfort; passive heating and cooling; water design and supply; daylighting and electric lighting; liquid and solid waste; and building noise control. This book also presents the latest information on fire protection, electrical systems; and elevator and escalator systems. This Thirteenth Edition features: Over 2,200 illustrations, with 200 new photographs and illustrations All-new coverage of high-performance building design Thoroughly revised references to codes and standards: ASHRAE, IES, USGBC (LEED), Living Building Challenge, WELL Building Standard, and more Updated offering of best-in-class ancillary materials for students and instructors available via the book's companion website Architect Registration Examination® (ARE®) style study questions available in the instructor's manual and student guide *Mechanical and Electrical*

Equipment for Buildings, has been the industry standard reference that comprehensively covers all aspects of building systems for over 80 years. This Thirteenth Edition has evolved to reflect the ever-growing complexities of building design, and has maintained its relevance by allowing for the conversation to include “why” as well as “how to.”

Heating, Ventilating, and Air Conditioning - J. Trost 1998

Helping building designers, developers, and constructors refine and improve their understanding of efficiency in building operation, this judicious, clear, and succinct book explains and details building heating and cooling requirements and ensuing utility costs, and proposes design opportunities and equipment choices that can produce comfortable, energy-efficient buildings. Quantifies building heat losses and gains, and describes heating-cooling operations. Integrates heating-cooling components with building structure and construction, providing specific building examples for heat/cool loads ; size air distribution components; HVAC options and HVAC zoning; annual heating/cooling costs. Evaluates energy conserving alternatives, and presents passive ("sustainable") design opportunities, such as solar control.

Faber and Kell's Heating and Air Conditioning of Buildings - Doug Oughton 2012-05-23

"Faber and Kell" has for over fifty years been accepted as the most practical and comprehensive book on heating and air conditioning design and is regarded as the standard reference book for both students and practitioners. In order to provide up-to-date information, this ninth edition has been revised to include the latest changes to system design and covers many aspects in greater depth, whilst still retaining the character of previous editions. Building services engineers, architects and others involved in the construction industry will find no better place for accessible and easily assimilated information on all aspects of the heating and air conditioning of buildings. revised throughout including a new chapter on natural ventilation and new information on facade engineering including photovoltaics full comparative summary of all air conditioning techniques makes this the essential reference for the professional