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NICKOLAS JAIDYN

Climatic Design Chelsea Green Publishing
 Following a rapid increase in the use of air conditioning in buildings of all types, the energy demand for powering such devices has become a significant cause for concern. Passive cooling is increasingly being thought of as the best alternative to air conditioning. This book offers the latest knowledge and techniques on passive cooling, enabling building professionals to understand the state of the art and employ relevant new strategies. With separate chapters on comfort, urban microclimate, solar control, ventilation, ground cooling and evaporative and

radiative cooling, this authoritative text will also be invaluable for architects, engineers and students working on building physics and low-energy design. *Advances in Passive Cooling* is part of the BEST series, edited by Mat Santamouris. The aim of the series is to present the most current, high quality theoretical and application oriented material in the field of solar energy and energy efficient buildings. Leading international experts cover the strategies and technologies that form the basis of high-performance, sustainable buildings, crucial to enhancing our built and urban environment. **Heating, Cooling, Lighting** John Wiley & Sons
 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. [Solar Energy in Buildings](#) Butterworth-Heinemann

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.

Optimal Design and Retrofit of Energy Efficient Buildings, Communities, and Urban Centers Wiley-Interscience

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.

Passive Building Design Springer

Natural heating and cooling of buildings helps to improve energy efficiency in the built environment. This book considers the principles of roof design and specific systems and cooling techniques. The authors explain the fundamental principles of roof cooling and describe in detail the relevant components, applications, built precedents, recent experimental work and key design considerations. Specific systems and techniques are examined, including the main advantages and disadvantages of each strategy. Environmental functions are considered in terms of protective strategies and selective strategies. Protective strategies include solar control, thermal insulation, heat storage and thermal inertia. Selective strategies include radiative, evaporative

and convective cooling and planting of roofs. Traditional and current roof construction practices are described, exemplified by case studies from across Europe. Including a free CD-ROM with software that enables readers to evaluate their own designs, this book will be invaluable for architects and engineers who wish to create buildings that are more energy-efficient.

Thermal Design of Buildings CRC Press

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.

Energy Efficient Buildings Routledge
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 difference 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.

Exergy Analysis and Thermoeconomics of Buildings John Wiley & Sons

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. *Energy Optimization and Prediction in Office Buildings* Woodhead Publishing
Energy use in buildings in the EU represents about 40% of the total annual energy consumption. With greater awareness of the need to reduce energy consumption comes a growth of interest in passive cooling, particularly as an alternative to air-conditioning. This book describes the fundamentals of passive cooling together with the principles and formulae necessary for its successful implementation. The material is comprised largely of information and results compiled under the SAVE European Research Programme.

Heating, Cooling, Lighting McGraw-Hill Companies

The art and the science of building systems design evolve continuously as designers, practitioners, and researchers all endeavor to improve the performance of buildings and the comfort and productivity of their occupants. Retaining coverage from the original second edition while updating the information in electronic form, *Heating and Cooling of*

Buildings: Design for Efficiency, Revised Second Edition presents the technical basis for designing the lighting and mechanical systems of buildings. Along with numerous homework problems, the revised second edition offers a full chapter on economic analysis and optimization, new heating and cooling load procedures and databases, and simplified procedures for ground coupled heat transfer calculations. The accompanying CD-ROM contains an updated version of the Heating and Cooling of Buildings (HCB) software program as well as electronic appendices that include over 1,000 tables in HTML format that can be searched by major categories, a table list, or an index of topics. Ancillary information is available on the book's website www.hcbcentral.com

From materials to computers, this edition explores the latest technologies exerting a profound effect on the design and operation of buildings. Emphasizing design optimization and critical thinking, the book continues to be the ultimate resource for understanding energy use in buildings.

Heating and Cooling of Buildings John Wiley & Sons

Optimal Design and Retrofit of Energy Efficient Buildings, Communities, and Urban Centers presents current techniques and technologies for energy efficiency in buildings. Cases introduce and demonstrate applications in both the design of new buildings and retrofit of existing structures. The book begins with an introduction that includes energy consumption statistics, building energy efficiency codes, and standards and labels from around the world. It then highlights the need for integrated and comprehensive energy analysis approaches. Subsequent sections present an overview of advanced energy efficiency technologies for buildings, including dynamic insulation materials, phase change materials, LED lighting and daylight controls, Life Cycle Analysis, and more. This book provides researchers and professionals with a coherent set of tools and techniques for enhancing energy efficiency in new and existing buildings. The case studies presented help practitioners implement the techniques and technologies in their own projects. Introduces a holistic analysis approach to energy efficiency for buildings using the concept of energy productivity Provides coverage of individual buildings, communities and urban centers Includes both the design of new buildings and retrofitting of existing structures to improve energy efficiency Describes state-of-the-art energy efficiency technologies

Presents several cases studies and examples that illustrate the analysis techniques and impact of energy efficiency technologies and controls

The Architecture of Natural Cooling The Crowood Press

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.

Passive Cooling of Buildings John Wiley & Sons

Energy Efficient Buildings A complete and authoritative discussion of the fundamentals of designing and engineering energy efficient buildings

In Energy Efficient Buildings: Fundamentals of Building Science and Thermal Systems, distinguished engineer and architect Dr. John Zhai delivers a comprehensive exploration of the design and engineering fundamentals of energy efficient buildings. The book introduces the fundamental knowledge, calculations, analyses, and principles used by designers of energy efficient buildings and addresses all essential elements of the discipline. An essential guide for students studying civil,

architectural, mechanical, and electrical engineering with a focus on energy, building systems, and building science, the book provides practical in-class materials, examples, and actual design practices, as well as end-of-chapter questions (with solutions) and sample group projects. Readers will find: A thorough introduction to the cross-disciplinary approach to the design of energy efficient buildings Comprehensive explorations of all critical elements of energy efficient building design, including standards and codes, psychometrics, microclimate, thermal comfort, indoor air quality, HVAC systems, and more In-depth discussions of the foundational knowledge, calculations, analysis, and principles needed to design energy efficient buildings Practical in-class examples and end-of-chapter questions with solutions for students, and design guidance and sample group projects for use in course lectures and actual design practices. Perfect for graduate and advanced undergraduate students studying building environmental systems, building systems in construction, and mechanical and electrical systems in construction, **Energy Efficient Buildings: Fundamentals of Building Science and Thermal Systems** will also earn a place in the libraries of practicing civil, architectural, and mechanical engineers.

Heating, Cooling, Lighting John Wiley & Sons

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

John Wiley & Sons

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.

Project data summaries Elsevier

This book describes the detailed process behind the development of a comprehensive thermo-bio-architectural framework (the ThBA). This framework

systematically connects the thermal performance requirements of a building to relevant solutions found in the natural world. This is the first time that architecture has been connected to biology in this manner. The book provides an in-depth understanding of thermoregulatory strategies in animals and plants and links these to equivalent solutions in architectural design. The inclusion of this fundamental knowledge, along with the systematic process of accessing it, should open up new avenues for the generation of energy efficient and sustainable buildings.

Thermal Analysis and Design of Passive Solar Buildings Elsevier Science Limited
Passive solar design techniques are becoming increasingly important in building design. This design reference book takes the building engineer or physicist step-by-step through the thermal analysis and design of passive solar buildings. In particular it emphasises two important topics: the maximum utilization of available solar energy and thermal storage, and the sizing of an appropriate auxiliary heating/cooling system in conjunction with good thermal control. *Thermal Analysis and Design of Passive Solar Buildings* is an important contribution towards the optimization of buildings as systems that act as natural filters between the indoor and outdoor environments, while maximizing the utilization of solar energy. As such it will be an essential source of information to engineers, architects, HVAC engineers and building physicists.

Modeling, Design, and Optimization of Net-Zero Energy Buildings Butterworth-

Heinemann

This book explains how energy demand and energy consumption in new buildings can be predicted and how these aspects and the resulting CO2 emissions can be reduced. It is based upon the authors' extensive research into the design and energy optimization of office buildings in Chile. The authors first introduce a calculation procedure that can be used for the optimization of energy parameters in office buildings, and to predict how a changing climate may affect energy demand. The prediction of energy demand, consumption and CO2 emissions is demonstrated by solving simple equations using the example of Chilean buildings, and the findings are subsequently applied to buildings around the globe. An optimization process based on Artificial Neural Networks is discussed in detail, which predicts heating and cooling energy demands, energy consumption and CO2 emissions. Taken together, these processes will show readers how to reduce energy demand, consumption and CO2 emissions associated with office buildings in the future. Readers will gain an advanced understanding of energy use in buildings and how it can be reduced.

Solar Heating and Cooling of Residential Buildings Routledge

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. *Heating and Cooling of Buildings: Design for Efficiency* Heating and Cooling of Buildings

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:

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