

## Troubleshooting Process Operations 4th Edition

Chemical production processes consist of many complex apparatuses involving both moving and static parts as well as interconnecting pipes, control mechanisms and electronics, mechanical and thermal stages, heat exchangers, waste and side product processing units, power ducts and many others. Bringing such a complicated unit online and ensuring its continued productivity requires substantial skill at anticipating, detecting and solving acute problems. This book is the professional's and student's entrance to the fascinating and important world of trouble shooting for chemical, pharmaceutical and other production processes. The Fourth Edition of Applied Process Design for Chemical and Petrochemical Plants Volume 2 builds upon the late Ernest E. Ludwig's classic chemical engineering process design manual. Volume Two focuses on distillation and packed towers, and presents the methods and fundamentals of plant design along with supplemental mechanical and related data, nomographs, data charts and heuristics. The Fourth Edition is significantly expanded and updated, with new topics that ensure readers can analyze problems and find practical design methods and solutions to accomplish their process design objectives. A true application-driven book, providing clarity and easy access to essential process plant data and design information Covers a complete range of basic day-to-day petrochemical operation topics Extensively revised with new material on distillation process performance; complex-mixture fractionating, gas processing, dehydration, hydrocarbon absorption and stripping; enhanced distillation types This 3rd edition provides chemical engineers with process control techniques that are used in practice while offering detailed mathematical analysis. Numerous examples and simulations are used to illustrate key theoretical concepts. New exercises are integrated throughout several chapters to reinforce concepts. This thoroughly updated edition of Fluid Catalytic Cracking Handbook provides practical information on the design, operation, troubleshooting, and optimization of fluid catalytic cracking (FCC) facilities. Based on the author's years of field experience, this expanded, second edition covers the latest technologies to improve the profitability and reliability of the FCC units, and provides several "no-to-low-cost" practical recommendations. A new chapter supplies valuable recommendations for debottlenecking and optimizing the performance of cat cracker operations.

Ludwig's Applied Process Design for Chemical and Petrochemical Plants

A Working Guide to Process Equipment, Fourth Edition

Volume 2: Distillation, packed towers, petroleum fractionation, gas processing and dehydration

Engineering Fundamentals: An Introduction to Engineering, SI Edition

Steam Turbine Surface Condensers and Refinery Vacuum Towers

***Understanding Process Equipment for Operators and Engineers explains how process equipment functions. As problems often***

arise in plants that must be solved by unit engineers, this book offers successful solutions and methods for their implementation. The concepts explained are based on Norm Lieberman's personal, hands-on experience. Like you, Norm attended a university and was exposed to technical seminars which did not always provide the needed solutions. In this text, you will learn the functioning of a variety of equipment types, including Fired Heater Draft, Centrifugal Pump Head, Distillation Tray Efficiency, Vacuum Jets, Recip Compressors, Steam Turbines, Thermosyphon Circulation Reboilers and Air Cooler. Includes methods and procedures on how to make field measurements Outlines fire heater principles and operation and how they develop draft Describes distillation column operation and methods to increase their efficiency Includes computer modeling and provides use case examples

Intelligent readers who want to build their own embedded computer systems-- installed in everything from cell phones to cars to handheld organizers to refrigerators-- will find this book to be the most in-depth, practical, and up-to-date guide on the market. Designing Embedded Hardware carefully steers between the practical and philosophical aspects, so developers can both create their own devices and gadgets and customize and extend off-the-shelf systems. There are hundreds of books to choose from if you need to learn programming, but only a few are available if you want to learn to create hardware. Designing Embedded Hardware provides software and hardware engineers with no prior experience in embedded systems with the necessary conceptual and design building blocks to understand the architectures of embedded systems. Written to provide the depth of coverage and real-world examples developers need, Designing Embedded Hardware also provides a road-map to the pitfalls and traps to avoid in designing embedded systems. Designing Embedded Hardware covers such essential topics as: The principles of developing computer hardware Core hardware designs Assembly language concepts Parallel I/O Analog-digital conversion Timers (internal and external) UART Serial Peripheral Interface Inter-Integrated Circuit Bus Controller Area Network (CAN) Data Converter Interface (DCI) Low-power operation This invaluable and eminently useful book gives you the practical tools and skills to develop, build, and program your own application-specific computers.

The most complete guide of its kind, this is the standard handbook for chemical and process engineers. All new material on fluid flow, long pipe, fractionators, separators and accumulators, cooling towers, gas treating, blending, troubleshooting field cases, gas solubility, and density of irregular solids. This substantial addition of material will also include conversion tables and a new appendix, "Shortcut Equipment Design Methods." This convenient volume helps solve field engineering problems with its hundreds of common sense techniques, shortcuts, and calculations. Here, in a compact, easy-to-use format, are practical tips, handy formulas, correlations, curves, charts, tables, and shortcut methods that will save engineers valuable time and effort. Hundreds of common sense techniques and calculations help users quickly and accurately solve day-to-day design, operations, and equipment problems.

The Leading Integrated Chemical Process Design Guide: Now with New Problems, New Projects, and More More than ever, effective design is the focal point of sound chemical engineering. Analysis, Synthesis, and Design of Chemical Processes, Third Edition, presents design as a creative process that integrates both the big picture and the small details—and knows which to stress when, and why. Realistic from start to finish, this book moves readers beyond classroom exercises into open-ended, real-world process problem solving. The authors introduce integrated techniques for every facet of the discipline, from finance to operations, new plant design to existing process optimization. This fully updated Third Edition presents entirely new problems at the end of every chapter. It also adds extensive coverage of batch process design, including realistic examples of equipment sizing for batch sequencing; batch scheduling for multi-product plants; improving production via intermediate storage and parallel equipment; and new optimization techniques specifically for batch processes. Coverage includes Conceptualizing and analyzing chemical processes: flow diagrams, tracing, process conditions, and more Chemical process economics: analyzing capital and manufacturing costs, and predicting or assessing profitability Synthesizing and optimizing chemical processing: experience-based principles, BFD/PFD, simulations, and more Analyzing process performance via I/O models, performance curves, and other tools Process

*troubleshooting and "debottlenecking" Chemical engineering design and society: ethics, professionalism, health, safety, and new "green engineering" techniques Participating successfully in chemical engineering design teams Analysis, Synthesis, and Design of Chemical Processes, Third Edition, draws on nearly 35 years of innovative chemical engineering instruction at West Virginia University. It includes suggested curricula for both single-semester and year-long design courses; case studies and design projects with practical applications; and appendixes with current equipment cost data and preliminary design information for eleven chemical processes—including seven brand new to this edition.*

*Principles, Process Design and Equipment*

*The Essentials of Interaction Design*

*Essential SNMP*

*Understanding Process Equipment for Operators and Engineers Wellhead to Transmission*

Providing coverage of design principles for distillation processes, this text contains a presentation of process and equipment design procedures. It also highlights limitations of some design methods, and offers guidance on how to overcome them.

Diagnose and Troubleshoot Problems in Chemical Process Equipment with This Updated Classic! Chemical engineers and plant operators can rely on the Third Edition of A Working Guide to Process Equipment for the latest diagnostic tips, practical examples, and detailed illustrations for pinpointing trouble and correcting problems in chemical process equipment. This updated classic contains new chapters on Control Valves, Cooling Towers, Waste Heat Boilers, Catalytic Effects, Fundamental Concepts of Process Equipment, and Process Safety. Filled with worked-out calculations, the book examines everything from trays, reboilers, instruments, air coolers, and steam turbines...to fired heaters, refrigeration systems, centrifugal pumps, separators, and compressors. The authors simplify complex issues and explain the technical issues needed to solve all kinds of equipment problems. Comprehensive and clear, the Third Edition of A Working Guide to Process Equipment features: Guidance on diagnosing and troubleshooting process equipment problems Explanations of how theory applies to real-world equipment operations Many useful tips, examples, illustrations, and worked-out calculations New to this edition: Control Valves, Cooling Towers, Waste Heat Boilers, Catalytic Effects, and Process Safety Inside this Renowned Guide to Solving Process Equipment

Problems • Trays • Tower Pressure • Distillation Towers • Reboilers • Instruments • Packed Towers • Steam and Condensate Systems • Bubble Point and Dew Point • Steam Strippers • Draw-Off Nozzle Hydraulics • Pumparounds and Tower Heat Flows • Condensers and Tower Pressure Control • Air Coolers • Deaerators and Steam Systems • Vacuum Systems • Steam Turbines • Surface Condensers • Shell-and-Tube Heat Exchangers • Fire Heaters • Refrigeration Systems • Centrifugal Pumps • Separators • Compressors • Safety • Corrosion • Fluid Flow • Computer Modeling and Control • Field Troubleshooting Process Problems

IT Essentials v7 Companion Guide supports the Cisco Networking Academy IT Essentials version 7 course. The course is designed for Cisco Networking Academy students who want to pursue careers in IT and learn how computers work, how to assemble computers, and how to safely and securely troubleshoot hardware and software issues. The features of the Companion Guide are designed to help you study and succeed in this course:

- Chapter objectives—Review core concepts by answering the focus questions listed at the beginning of each chapter.
- Key terms—Refer to the updated lists of networking vocabulary introduced, and turn to the highlighted terms in context.
- Course section numbering—Follow along with the course heading numbers to easily jump online to complete labs, activities, and quizzes referred to within the text.
- Check Your Understanding Questions and Answer Key—Evaluate your readiness with the updated end-of-chapter questions that match the style of questions you see on the online course quizzes.

This book is part of the Cisco Networking Academy Series from Cisco Press®. Books in this series support and complement the Cisco Networking Academy. Specifically designed as an introduction to the exciting world of engineering, **ENGINEERING FUNDAMENTALS: AN INTRODUCTION TO ENGINEERING** encourages students to become engineers and prepares them with a solid foundation in the fundamental principles and physical laws. The book begins with a discovery of what engineers do as well as an inside look into the various areas of specialization. An explanation on good study habits and what it takes to succeed is included as well as an introduction to design and problem solving, communication, and ethics. Once this foundation is established, the book moves on to the basic physical concepts and laws that students will encounter regularly. The framework of this text teaches students that engineers apply physical and chemical laws and principles as well as mathematics to design, test, and supervise the production of millions of parts, products, and services that people use every day. By gaining problem solving skills and an understanding of fundamental principles, students are on their

way to becoming analytical, detail-oriented, and creative engineers. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Successful Trouble Shooting for Process Engineers

Facts, Fiction and Fables

Fluid Catalytic Cracking Handbook

Process Equipment Malfunctions: Techniques to Identify and Correct Plant Problems

Introduction to Process Technology

Over the years, thousands of tools have been developed for debugging TCP/IP networks. They range from very specialized tools that do one particular task, to generalized suites that do just about everything except replace bad Ethernet cables. Even better, many of them are absolutely free. There's only one problem: who has time to track them all down, sort through them for the best ones for a particular purpose, or figure out how to use them? Network Troubleshooting Tools does the work for you--by describing the best of the freely available tools for debugging and troubleshooting. You can start with a lesser-known version of ping that diagnoses connectivity problems, or take on a much more comprehensive program like MRTG for graphing traffic through network interfaces. There's tkined for mapping and automatically monitoring networks, and Ethereal for capturing packets and debugging low-level problems. This book isn't just about the tools available for troubleshooting common network problems. It also outlines a systematic approach to network troubleshooting: how to document your network so you know how it behaves under normal conditions, and how to think about problems when they arise, so you can solve them more effectively. The topics covered in this book include: Understanding your network Connectivity testing Evaluating the path between two network nodes Tools for capturing packets Tools for network discovery and mapping Tools for working with SNMP Performance monitoring Testing application layer protocols Software sources If you're involved with network operations, this book will save you time, money, and needless experimentation.

Addressing modern process plant operations in an easy-to-understand format, this comprehensive book reveals the important role technicians play in the function of a business unit. The author thoroughly examines operator responsibilities and functions, from recognizing opportunities that improve process operations, to detecting and removing threats to steady-state operation. The book also systematically explores business fundamentals and the importance of quality, as well as the chemistry and physics of process operations, maintenance duties,

material handling, and process troubleshooting techniques. Now thoroughly expanded and updated, the Second Edition of this trusted guide includes new chapters on jobs in process technology, environmental compliance, emergency response, and instrumentation. With numerous new and revised tables and photos, as well as additional learning resources to promote Internet research and critical thinking, the book is an even more useful and effective resource for current and future process plant technicians. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

#### A PRACTICAL GUIDE TO TROUBLESHOOTING PROCESS EQUIPMENT

**MALFUNCTIONS** Process Equipment Malfunctions offers proven techniques for finding and fixing process plant problems and contains details on failure identification. Diagnostic tips, examples, and illustrations help to pinpoint and correct faults in chemical process and petroleum refining equipment. Complex math has been omitted. An essential resource for plant operators and process engineers, this book is based on the author's long career in field troubleshooting process problems. **COVERAGE INCLUDES:** Distillation tray malfunctions Packed tower problems Distillation tower pressure and composition control Fractionator product stripping Pumparounds Reboiled and steam side strippers Inspecting tower internals Process reboilers--thermosyphon circulation Heat exchangers Condenser limitations Air coolers Cooling water systems Steam condensate collection systems Steam quality problems Level control problems Process plant corrosion and fouling Vapor-liquid separation vessels Hydrocarbon-water separation and desalters Fired heaters--draft and excess O<sub>2</sub> Disabling safety systems Vacuum systems and steam jets Vacuum surface condensers Centrifugal pump limitations Steam turbine drivers Centrifugal compressors Reciprocating compressors The essential interaction design guide, fully revised and updated for the mobile age **About Face: The Essentials of Interaction Design, Fourth Edition** is the latest update to the book that shaped and evolved the landscape of interaction design. This comprehensive guide takes the worldwide shift to smartphones and tablets into account. New information includes discussions on mobile apps, touch interfaces, screen size considerations, and more. The new full-color interior and unique layout better illustrate modern design concepts. The interaction design profession is blooming with the success of design-intensive companies, priming customers to expect "design" as a critical ingredient of marketplace success. Consumers have little tolerance for websites, apps, and devices that don't live up to their expectations, and the responding shift in business

philosophy has become widespread. About Face is the book that brought interaction design out of the research labs and into the everyday lexicon, and the updated Fourth Edition continues to lead the way with ideas and methods relevant to today's design practitioners and developers. Updated information includes: Contemporary interface, interaction, and product design methods Design for mobile platforms and consumer electronics State-of-the-art interface recommendations and up-to-date examples Updated Goal-Directed Design methodology Designers and developers looking to remain relevant through the current shift in consumer technology habits will find About Face to be a comprehensive, essential resource.

Distillation Design

Network Troubleshooting Tools

Help for Network Administrators

Troubleshooting Natural Gas Processing

Learning the Unix Operating System

*Suitable for both aspiring process technicians and active process technology professionals, this wide-ranging guide provides a thorough grounding in the history, science, technology, equipment, systems, operations, and troubleshooting principles associated with modern manufacturing. Following years of widespread use and testing, INTRODUCTION TO PROCESS TECHNOLOGY, Fourth Edition, is a proven product featuring a logical sequence of topics—including safety, instrumentation, applied physics and chemistry, and quality control—aligned to the structure of accredited college courses and professional training programs. Technically accurate and up to date, the Fourth Edition remains affordable, reader-friendly, and highly visual, with ample illustrations and photographs to make complex technical concepts easier to understand and apply. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.*

*Were you looking for the book with access to MyLab Operations Management? This product is the book alone and does NOT come with access to the MyLab. Buy Operations Management, 8th edition with MyLab Operations Management access card (ISBN 9781292254036) if you need access to the MyLab as well, and save money on this resource. You will also need a course ID from your instructor to access the MyLab. Operations management is important, exciting, challenging ... and everywhere you look! · Important, because it enables organizations to provide services and products that we all need · Exciting, because it is central to constant changes in customer preference, networks of supply and demand, and developments in technology · Challenging, because solutions must be must be financially sound, resource-efficient, as well as environmentally and socially responsible · And everywhere, because in our daily lives, whether at work or at home, we all experience and manage processes and operations.*

*A handy book for someone just starting with Unix or Linux, and an ideal primer for Mac and PC users of the Internet who need to know a little about Unix on the systems they visit. The most effective introduction to Unix in print, covering Internet usage for email, file transfers, web browsing, and many major and minor updates to help the reader navigate the ever-expanding capabilities of the operating system.*

*Practical Process Control (loop tuning and troubleshooting). This book differs from others on the market in several respects. First, the presentation is totally in the time domain (the word "LaPlace" is nowhere to be found). The focus of the book is actually troubleshooting, not tuning. If a controller is "tunable", the tuning procedure will be straightforward and uneventful. But if a loop is "untunable", difficulties will be experienced, usually early in the tuning effort. The nature of any difficulty provides valuable clues to what is rendering the loop "untunable". For example, if reducing the controller gain leads to increased oscillations, one should look for possible interaction with one or more other loops. Tuning difficulties are always symptoms of other problems; effective troubleshooting involves recognizing the clues, identifying the root cause of the problem, and making corrections. Furthermore, most loops are rendered "untunable" due to some aspect of the steady-state behavior of the process. Consequently, the book focuses more on the relationship of process control to steady-state process characteristics than to dynamic process characteristics. One prerequisite to effective troubleshooting is to "demystify" some of the characteristics of the PID control equations. One unique aspect of this book is that it explains in the time domain all aspects of the PID control equation (including as the difference between the parallel and series forms of the PID, the reset feedback form of the PID equation, reset windup protection, etc.) The book stresses an appropriate P&I (process and instrumentation) diagram as critical to successful tuning. If the P&I is not right, tuning difficulties are inevitable. Developing and analyzing P&I diagrams is a critical aspect of troubleshooting.*

*Machinery Failure Analysis and Troubleshooting*

*Microsoft System Center Configuration Manager Field Experience*

*The Immunoassay Handbook*

*Operations Management*

*Tuning and Troubleshooting*

**THE FIRST BOOK OF ITS KIND ON DISTILLATION TECHNOLOGY**

The last half-century of research on distillation has tremendously improved our understanding and design of industrial distillation equipment and systems. High-speed computers have taken over the design, control, and operation of towers. Invention and innovation in tower internals have greatly enhanced tower capacity and efficiency. With all these advances, one would expect the failure rate in distillation towers to be on the decline. In fact, the opposite is the case: the tower failure rate is on the rise and accelerating. Distillation

Troubleshooting collects invaluable hands-on experiences acquired in dealing with distillation and absorption malfunctions, making them readily accessible for those engaged in solving today's problems and avoiding tomorrow's. The first book of its kind on the distillation industry, the practical lessons it offers are a must for those seeking the elusive path to trouble-free distillation. Distillation

Troubleshooting covers over 1,200 case histories of problems, diagnoses, solutions, and key lessons. Coverage includes: \* Successful and unsuccessful struggles with plugging, fouling, and coking \* Histories and prevention of tray, packing, and internals damage \* Lessons taught by incidents and accidents during shutdowns, commissioning, and abnormal operation \* Troubleshooting distillation simulations to match the real world \* Making packing liquid distributors work \* Plant bottlenecks from intermediate draws, chimney trays, and feed points \* Histories of and key lessons from explosions and fires in distillation towers \* Prevention of flaws that impair reboiler and condenser performance \* Destabilization of tower control systems and how to correct it \* Discoveries from shutdown inspections \* Suppression of foam and accumulation incidents A unique resource for improving the foremost industrial separation process, Distillation Troubleshooting transforms decades of hands-on experiences into a handy reference for professionals and students involved in the operation, design, study, improvement, and management of large-scale distillation.

Developed by the recognized authority in the field, PROCESS TECHNOLOGY EQUIPMENT AND SYSTEMS, 4e introduces you to the concepts and techniques used in today's most sophisticated manufacturing facilities. This book delivers technical accuracy along with an engaging writing style, and supports readings with full-color graphics and photos that show how systems and equipment operate in the real world. Chapters explore the workings of valves, vessels, and piping; pumps and compressors; motors and turbines; heat exchangers, cooling towers, boilers, and furnaces; reactors and distillation; extraction and separation systems; process instrumentation; and much more. Upholding the tradition of excellence established by the first two editions, PROCESS TECHNOLOGY EQUIPMENT AND SYSTEMS, 4e can help launch your career as a process technology technician! Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

The latest methods for troubleshooting and maintaining process equipment Applicable to a broad range of technicians and industries and fully updated throughout, A Working Guide to Process Equipment,

Fourth Edition, explains how to diagnose, troubleshoot, and correct problems with chemical and petroleum refining process equipment. Nine new chapters cover: Tray design details Shell-and-tube heat exchanger design details Relief valve system design Vapor lock and exchanger flooding in steam systems Steam generation operating and design details Wastewater strippers Thermodynamics -- how it applies to process equipment Centrifugal pumps -- reducing seal and bearing failures Hand calculations for distillation towers Vapor -- liquid equilibrium, absorption, and stripping calculations Filled with examples and illustrations, this practical resource demonstrates how theory applies to solving real-world plant operation problems.

Selected hand calculation methods are also provided. Comprehensive coverage includes: Distillation Tower Trays \* Tower Pressure Control \* Distillation Towers \* Reboilers \* Tower Internals \* Instruments \* Packed Towers \* Steam and Condensate Systems \* Bubble Point and Dew Point \* Steam Strippers \* Draw-Off Nozzle Hydraulics \* Pumparounds and Tower Heat Flows \* Condensers and Tower Pressure Control \* Air Coolers \* Deaerators and Steam Systems \* Steam Generation \* Wastewater Strippers \* Vacuum Systems \* Steam Turbines \* Surface Condensers \* Shell-and-Tube Heat Exchangers \* Fired Heaters \* Refrigeration Systems \* Cooling Water Systems \* Catalytic Effects \* Centrifugal Pumps \* Control Valves \* Separators \* Centrifugal Compressors and Surge \* Reciprocating Compressors \* Corrosion \* Fluid Flow in Pipes \* Super-Fractionation Stage \* Computer Control \* Field Troubleshooting

Examines real life problems and solutions for operators and engineers running process controls Expands on the first book with the addition of five new chapters as well as new troubleshooting examples Written for the working operator and engineer, with straightforward instruction not hinged on complex math Includes real-life examples of control problems that commonly arise and how to fix them

Emphasizes single and well-established process engineering principles that will help working engineers and operators switch manual control loops to automatic control

Troubleshooting Process Operations

Process Technology Plant Operations

Distillation Troubleshooting

A Practical Guide to Avoiding and Correcting Mistakes

Fermentation and Biochemical Engineering Handbook, 2nd Ed.

The book focuses on process control in the petroleum and refinery industries, with an emphasis on problem solving. The author explores various real life examples and relays the lessons learned from his career in this area. He explains many new yet straightforward concepts without the use of complex mathematics. This handy go-to emphasizes single and well-established process engineering

principles that will help working engineers and operators switch manual control loops to auto control.

This is not your average technical book! Using a humorous and easy-to-understand approach to solving common process engineering problems, this unique volume is the go-to guide for any veteran or novice engineer in the plant, office, or classroom. Textbooks are often too theoretical to help the average process engineer solve everyday problems in the plant, and generic handbooks are often out of date and not comprehensive. This guide focuses on the most common problems that every process engineer faces and how to solve them. The "characters" walk the reader through every problem and solution step-by-step, through dialogues that literally occur every day in process plants around the world. Over half a century of experience and many books, videos, and seminars to his credit, Norm Lieberman is well-known all over the world and has helped countless companies and engineers solve problems through issues with equipment, processes, and training. This is the first time that this knowledge has appeared in a format like this, quite unlike anything ever published before in books on process engineering. This is a must-have for any engineer working in process engineering.

Vacuum systems are in wide spread use in the petrochemical plants, petroleum refineries and power generation plants. The existing texts on this subject are theoretical in nature and only deal with the equipment functions when in good mechanical conditions, from the viewpoint of the equipment vendor. In this much-anticipated volume, one of the most well-respected and prolific process engineers in the world takes on troubleshooting vacuum systems, and especially steam ejectors, an extremely complex and difficult subject that greatly affects the profitability of the majority of the world's refineries.

Part of a series of specialized guides on System Center - this book shares real-world expertise on using Configuration Manager capabilities to deliver more effective IT services. Series editor Mark Tulloch and a team of System Center experts provide concise technical guidance as they step through key deployment and management scenarios.

A Complete Course in Case Studies

A Concise Guide for the New User

Process Engineering

A Manual of Quick, Accurate Solutions to Everyday Process Engineering Problems

Principles, Practice and Economics of Plant and Process Design

*The Handbook of Water and Wastewater Treatment Plant Operations is the first thorough resource manual developed exclusively for water and wastewater plant operators. Now regarded as an industry standard, this fourth edition has been updated throughout, and explains the material in easy-to-understand language. It also provides real-world case studies and operating scenarios, as well as problem-solving practice sets for each scenario. Features: Updates the material to reflect the developments in the field Includes new math operations with solutions, as well as over 250 new sample questions Adds updated coverage of energy conservation measures with applicable case studies Enables users to properly operate water and wastewater plants and suggests troubleshooting procedures for returning a plant to optimum operation levels Prepares operators for licensure exams A complete compilation of water science, treatment information, process control procedures, problem-solving techniques, safety and health information, and administrative and technological trends, this text serves as a resource for professionals working in water and wastewater operations and operators preparing for wastewater licensure exams. It can also be used as a supplemental textbook for undergraduate and graduate students studying environmental science, water science, and environmental engineering.*

*This is a well-rounded handbook of fermentation and biochemical engineering presenting techniques for the commercial production of chemicals and pharmaceuticals via fermentation. Emphasis is given to unit operations fermentation, separation, purification, and recovery. Principles, process design, and equipment are detailed. Environment aspects*

are covered. The practical aspects of development, design, and operation are stressed. Theory is included to provide the necessary insight for a particular operation. Problems addressed are the collection of pilot data, choice of scale-up parameters, selection of the right piece of equipment, pinpointing of likely trouble spots, and methods of troubleshooting. The text, written from a practical and operating viewpoint, will assist development, design, engineering and production personnel in the fermentation industry. Contributors were selected based on their industrial background and orientation. The book is illustrated with numerous figures, photographs and schematic diagrams.

Part I: Process design -- Introduction to design -- Process flowsheet development -- Utilities and energy efficient design -- Process simulation -- Instrumentation and process control -- Materials of construction -- Capital cost estimating -- Estimating revenues and production costs -- Economic evaluation of projects -- Safety and loss prevention -- General site considerations -- Optimization in design -- Part II: Plant design -- Equipment selection, specification and design -- Design of pressure vessels -- Design of reactors and mixers -- Separation of fluids -- Separation columns (distillation, absorption and extraction) -- Specification and design of solids-handling equipment -- Heat transfer equipment -- Transport and storage of fluids.

Drawing on his passion, training, and experience, Lieberman presents problems and troubleshooting techniques that are associated with specific processes, systems, and equipment, leading novice and practiced troubleshooters alike to the crux of malfunctions and failures. The fourth edition updates troubleshooting and design techniques, and adds seven new chapters with information on turbines, motors, heat exchangers, and environmentally friendly operations. Norm Lieberman sprinkles his troubleshooting guide with insightful and humorous anecdotes from 45 years in the petrochemical and refining industry. Features: \* Nitty-gritty descriptions of common refinery and chemical plant problems and the diagnostic field observations, experiments, and calculations that reveal their origin \* Troubleshooting checklists and references following each chapter \* Practical advice for optimizing interactions with key plant operations personnel

Chemical Engineering Design

Process Technology Equipment and Systems

Theory and Applications of Ligand Binding, ELISA and Related Techniques

About Face

Troubleshooting Vacuum Systems

**Simple Network Management Protocol (SNMP) provides a "simple" set of operations that allows you to more easily monitor and manage network devices like routers, switches, servers, printers, and more. The information you can monitor with SNMP is wide-ranging--from standard items, like the amount of traffic flowing into an interface, to far more esoteric items, like the air temperature inside a router. In spite of its name, though, SNMP is not especially simple to learn. O'Reilly has answered the call for help with a practical introduction that shows how to install, configure, and manage SNMP. Written for network and system administrators, the book introduces the basics of SNMP and then offers a technical background on how to use it effectively. Essential SNMP explores both commercial and open source packages, and elements like OIDs, MIBs, community strings, and traps are covered in depth. The book contains five new chapters and various updates throughout. Other new topics include: Expanded coverage of SNMPv1, SNMPv2, and SNMPv3 Expanded coverage of SNMPc The concepts behind network management and change management RRDTool and Cricket The use of scripts for a variety of tasks How Java can be**

**used to create SNMP applications Net-SNMP's Perl module The bulk of the book is devoted to discussing, with real examples, how to use SNMP for system and network administration tasks. Administrators will come away with ideas for writing scripts to help them manage their networks, create managed objects, and extend the operation of SNMP agents. Once demystified, SNMP is much more accessible. If you're looking for a way to more easily manage your network, look no further than Essential SNMP, 2nd Edition.**

**The fourth edition of The Immunoassay Handbook provides an excellent, thoroughly updated guide to the science, technology and applications of ELISA and other immunoassays, including a wealth of practical advice. It encompasses a wide range of methods and gives an insight into the latest developments and applications in clinical and veterinary practice and in pharmaceutical and life science research. Highly illustrated and clearly written, this award-winning reference work provides an excellent guide to this fast-growing field. Revised and extensively updated, with over 30% new material and 77 chapters, it reveals the underlying common principles and simplifies an abundance of innovation. The Immunoassay Handbook reviews a wide range of topics, now including lateral flow, microsphere multiplex assays, immunohistochemistry, practical ELISA development, assay interferences, pharmaceutical applications, qualitative immunoassays, antibody detection and lab-on-a-chip. This handbook is a must-read for all who use immunoassay as a tool, including clinicians, clinical and veterinary chemists, biochemists, food technologists, environmental scientists, and students and researchers in medicine, immunology and proteomics. It is an essential reference for the immunoassay industry. Provides an excellent revised guide to this commercially highly successful technology in diagnostics and research, from consumer home pregnancy kits to AIDS testing.**

**www.immunoassayhandbook.com is a great resource that we put a lot of effort into. The content is designed to encourage purchases of single chapters or the entire book. David Wild is a healthcare industry veteran, with experience in biotechnology, pharmaceuticals, medical devices and immunodiagnostics, which remains his passion. He worked for Amersham, Eastman-Kodak, Johnson & Johnson, and Bristol-Myers Squibb, and consulted for diagnostics and biotechnology companies. He led research and development programs, design and construction of chemical and biotechnology plants, and integration of acquired companies. Director-level positions included Research and Development, Design Engineering, Operations and Strategy, for billion dollar businesses. He retired from full-time work in 2012 to focus on his role as Editor of The Immunoassay Handbook, and advises on product development, manufacturing and marketing. Provides a unique mix of theory, practical advice and applications, with numerous examples Offers explanations of technologies under development and practical insider tips that are sometimes omitted from scientific papers Includes a comprehensive troubleshooting guide, useful for solving problems and improving assay performance Provides valuable chapter updates, now available on [www.immunoassayhandbook.com](http://www.immunoassayhandbook.com)**

**The author, a highly respected consultant to major U.S. refineries, shares information on topics such as common coke quality questions, catalyst-feed**

***mixing, light hydrocarbon distillation, steam to heater passes, haze in jet fuel, optimizing excess air, convection and radiation, reboiler-induced foaming, flooding and computer control consoles. Of special interest in the new section on gas drying and compression. A troubleshooting checklist accompanies each chapter. The author expertly combines field observations with engineering principles to unravel and solve specific process operation problems using an easy-to-understand style devoid of textbook terminology and excessive mathematics. Contents: Specific processes Process equipment Practical problems Gas drying and compression The process engineer's job Appendix. Practical Process Control Designing Embedded Hardware IT Essentials Companion Guide v7 An Expert Guide to the Practical Operation, Design, and Optimization of FCC Units Troubleshooting Process Plant Control***