

Matlab Chemical Engineer

AS RECOGNIZED, ADVENTURE AS WITHOUT DIFFICULTY AS EXPERIENCE JUST ABOUT LESSON, AMUSEMENT, AS WITH EASE AS CONTRACT CAN BE GOTTEN BY JUST CHECKING OUT A BOOK **MATLAB CHEMICAL ENGINEER** THEN IT IS NOT DIRECTLY DONE, YOU COULD RESIGN YOURSELF TO EVEN MORE RE THIS LIFE, APPROACHING THE WORLD.

WE OFFER YOU THIS PROPER AS WELL AS SIMPLE PRETENTIOUSNESS TO GET THOSE ALL. WE GIVE MATLAB CHEMICAL ENGINEER AND NUMEROUS BOOK COLLECTIONS FROM FICTIONS TO SCIENTIFIC RESEARCH IN ANY WAY. ACCOMPANIED BY THEM IS THIS MATLAB CHEMICAL ENGINEER THAT CAN BE YOUR PARTNER.

INTRODUCTION TO CHEMICAL ENGINEERING COMPUTING -
BRUCE A. FINLAYSON 2012-07-31

STEP-BY-STEP INSTRUCTIONS ENABLE CHEMICAL ENGINEERS TO MASTER KEY SOFTWARE PROGRAMS AND SOLVE COMPLEX PROBLEMS TODAY, BOTH STUDENTS AND PROFESSIONALS IN CHEMICAL ENGINEERING MUST SOLVE INCREASINGLY COMPLEX PROBLEMS DEALING WITH REFINERIES, FUEL CELLS, MICROREACTORS, AND PHARMACEUTICAL PLANTS, TO NAME A FEW. WITH THIS BOOK AS THEIR GUIDE, READERS LEARN TO SOLVE THESE PROBLEMS USING THEIR COMPUTERS AND EXCEL®, MATLAB, ASPEN PLUS, AND COMSOL MULTIPHYSICS. MOREOVER, THEY LEARN HOW TO CHECK THEIR SOLUTIONS AND VALIDATE THEIR RESULTS TO MAKE SURE THEY HAVE SOLVED THE PROBLEMS CORRECTLY. NOW IN ITS SECOND EDITION, INTRODUCTION TO CHEMICAL ENGINEERING COMPUTING IS BASED ON THE AUTHOR'S FIRSTHAND TEACHING EXPERIENCE. AS A RESULT, THE EMPHASIS IS ON PROBLEM SOLVING. SIMPLE INTRODUCTIONS HELP READERS BECOME CONVERSANT WITH EACH PROGRAM AND THEN TACKLE A BROAD RANGE OF PROBLEMS IN CHEMICAL ENGINEERING, INCLUDING: EQUATIONS OF STATE CHEMICAL REACTION EQUILIBRIA MASS BALANCES WITH RECYCLE STREAMS THERMODYNAMICS AND SIMULATION OF MASS TRANSFER EQUIPMENT PROCESS SIMULATION FLUID FLOW IN TWO AND THREE DIMENSIONS ALL THE CHAPTERS CONTAIN CLEAR INSTRUCTIONS, FIGURES, AND EXAMPLES TO GUIDE READERS THROUGH ALL THE PROGRAMS AND TYPES OF CHEMICAL ENGINEERING PROBLEMS. PROBLEMS AT THE END OF EACH CHAPTER, RANGING FROM SIMPLE TO DIFFICULT, ALLOW READERS TO GRADUALLY BUILD THEIR SKILLS, WHETHER THEY SOLVE THE PROBLEMS THEMSELVES OR IN TEAMS. IN ADDITION, THE BOOK'S ACCOMPANYING WEBSITE LISTS THE CORE PRINCIPLES LEARNED FROM EACH PROBLEM, BOTH FROM A CHEMICAL ENGINEERING AND A COMPUTATIONAL PERSPECTIVE. COVERING A BROAD RANGE OF DISCIPLINES AND PROBLEMS WITHIN CHEMICAL ENGINEERING, INTRODUCTION TO CHEMICAL ENGINEERING COMPUTING IS RECOMMENDED FOR BOTH UNDERGRADUATE AND GRADUATE STUDENTS AS WELL AS PRACTICING ENGINEERS WHO WANT TO KNOW HOW TO CHOOSE THE RIGHT COMPUTER SOFTWARE PROGRAM AND TACKLE ALMOST ANY CHEMICAL ENGINEERING PROBLEM.

SUSTAINABLE ENVIRONMENTAL ENGINEERING - WALTER Z. TANG 2018-08-01

THE IMPORTANT RESOURCE THAT EXPLORES THE TWELVE DESIGN PRINCIPLES OF SUSTAINABLE ENVIRONMENTAL ENGINEERING SUSTAINABLE ENVIRONMENTAL ENGINEERING (SEE)

IS TO RESEARCH, DESIGN, AND BUILD ENVIRONMENTAL ENGINEERING INFRASTRUCTURE SYSTEM (EES) IN HARMONY WITH NATURE USING LIFE CYCLE COST ANALYSIS AND BENEFIT ANALYSIS AND LIFE CYCLE ASSESSMENT AND TO PROTECT HUMAN HEALTH AND ENVIRONMENTS AT MINIMAL COST. THE FOUNDATIONS OF THE SEE ARE THE TWELVE DESIGN PRINCIPLES (TDPs) WITH THREE SPECIFIC RULES FOR EACH PRINCIPLE. THE TDPs ATTEMPT TO TRANSFORM HOW ENVIRONMENTAL ENGINEERING COULD BE TAUGHT BY PRIORITIZING SIX DESIGN HIERARCHIES THROUGH SIX DIFFERENT DIMENSIONS. SIX DESIGN HIERARCHIES ARE PREVENTION, RECOVERY, SEPARATION, TREATMENT, REMEDIATION, AND OPTIMIZATION. SIX DIMENSIONS ARE INTEGRATED SYSTEM, MATERIAL ECONOMY, RELIABILITY ON SPATIAL SCALE, RESILIENCY ON TEMPORAL SCALE, AND COST EFFECTIVENESS. IN ADDITION, THE AUTHORS, TWO EXPERTS IN THE FIELD, INTRODUCE MAJOR COMPUTER PACKAGES THAT ARE USEFUL TO SOLVE REAL ENVIRONMENTAL ENGINEERING DESIGN PROBLEMS. THE TEXT PRESENTS HOW SPECIFIC ENVIRONMENTAL ENGINEERING ISSUES COULD BE IDENTIFIED AND PRIORITIZED UNDER CLIMATE CHANGE THROUGH QUANTIFICATION OF AIR, WATER, AND SOIL QUALITY INDEXES. FOR WATER POLLUTION CONTROL, EIGHT INNOVATIVE TECHNOLOGIES WHICH ARE CRITICAL IN THE PARADIGM SHIFT FROM THE CONVENTIONAL ENVIRONMENTAL ENGINEERING DESIGN TO WATER RESOURCE RECOVERY FACILITY (WRRF) ARE EXAMINED IN DETAIL. THESE NEW PROCESSES INCLUDE UV DISINFECTION, MEMBRANE SEPARATION TECHNOLOGIES, ANAMMOX, MEMBRANE BIOLOGICAL REACTOR, STRUVITE PRECIPITATION, FENTON PROCESS, PHOTOCATALYTIC OXIDATION OF ORGANIC POLLUTANTS, AS WELL AS GREEN INFRASTRUCTURE. COMPUTER TOOLS ARE PROVIDED TO FACILITATE LIFE CYCLE COST AND BENEFIT ANALYSIS OF WRRF. THIS IMPORTANT RESOURCE: • INCLUDES STATISTICAL ANALYSIS OF ENGINEERING DESIGN PARAMETERS USING STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES (SPSS) • PRESENTS MONTE CARLOS SIMULATION USING CRYSTAL BALL TO QUANTIFY UNCERTAINTY AND SENSITIVITY OF DESIGN PARAMETERS • CONTAINS DESIGN METHODS OF NEW ENERGY, MATERIALS, PROCESSES, PRODUCTS, AND SYSTEM TO ACHIEVE ENERGY POSITIVE WRRF THAT ARE ILLUSTRATED WITH MATLAB • PROVIDES INFORMATION ON LIFE CYCLE COSTS IN TERMS OF CAPITAL AND OPERATION FOR DIFFERENT PROCESSES USING MATLAB WRITTEN FOR SENIOR OR GRADUATES IN ENVIRONMENTAL OR CHEMICAL ENGINEERING, SUSTAINABLE ENVIRONMENTAL ENGINEERING DEFINES AND ILLUSTRATES THE

TDPs of SEE. UNDERGRADUATE, GRADUATE, AND ENGINEERS SHOULD FIND THE COMPUTER CODES ARE USEFUL IN THEIR EEIS DESIGN. THE EXERCISE AT THE END OF EACH CHAPTER ENCOURAGES STUDENTS TO IDENTIFY EEI ENGINEERING PROBLEMS IN THEIR OWN CITY AND FIND CREATIVE SOLUTIONS BY APPLYING THE TDPs. FOR MORE INFORMATION, PLEASE VISIT WWW.TANG.FIU.EDU.

MATLAB PROGRAMMING FOR BIOMEDICAL ENGINEERS AND SCIENTISTS - ANDREW P. KING 2022-07-01

MATLAB PROGRAMMING FOR BIOMEDICAL ENGINEERS AND SCIENTISTS, SECOND EDITION PROVIDES AN EASY-TO-LEARN INTRODUCTION TO THE FUNDAMENTALS OF COMPUTER PROGRAMMING IN MATLAB. THE BOOK EXPLAINS THE PRINCIPLES OF GOOD PROGRAMMING PRACTICE, WHILE ALSO DEMONSTRATING HOW TO WRITE EFFICIENT AND ROBUST CODE THAT ANALYZES AND VISUALIZES BIOMEDICAL DATA. AIMED AT THE BIOMEDICAL ENGINEERING STUDENT, BIOMEDICAL SCIENTIST AND MEDICAL RESEARCHER WITH LITTLE OR NO COMPUTER PROGRAMMING EXPERIENCE, THIS IS AN EXCELLENT RESOURCE FOR LEARNING THE PRINCIPLES AND PRACTICE OF COMPUTER PROGRAMMING USING MATLAB. THE BOOK ENABLES THE READER TO ANALYZE PROBLEMS AND APPLY STRUCTURED DESIGN METHODS TO PRODUCE ELEGANT, EFFICIENT AND WELL-STRUCTURED PROGRAM DESIGNS, IMPLEMENT A STRUCTURED PROGRAM DESIGN IN MATLAB, WRITE CODE THAT MAKES GOOD USE OF MATLAB PROGRAMMING FEATURES, INCLUDING CONTROL STRUCTURES, FUNCTIONS AND ADVANCED DATA TYPES, AND MUCH MORE. PRESENTS MANY REAL-WORLD BIOMEDICAL PROBLEMS AND DATA, SHOWING THE PRACTICAL APPLICATION OF PROGRAMMING CONCEPTS CONTAINS TWO WHOLE CHAPTERS DEDICATED TO THE PRACTICALITIES OF DESIGNING AND IMPLEMENTING MORE COMPLEX PROGRAMS PROVIDES AN ACCOMPANYING WEBSITE WITH FREELY AVAILABLE DATA AND SOURCE CODE FOR THE PRACTICAL CODE EXAMPLES, ACTIVITIES AND EXERCISES IN THE BOOK INCLUDES NEW CHAPTERS ON MACHINE LEARNING, ENGINEERING MATHEMATICS, AND EXPANDED COVERAGE OF DATA TYPES

NUMERICAL METHODS WITH CHEMICAL ENGINEERING

APPLICATIONS - KEVIN D. DORFMAN 2017-01-11

THIS UNDERGRADUATE TEXTBOOK INTEGRATES THE TEACHING OF NUMERICAL METHODS AND PROGRAMMING WITH PROBLEMS FROM CORE CHEMICAL ENGINEERING SUBJECTS.

NUMERICAL METHODS FOR CHEMICAL ENGINEERING - KENNETH J BEERS 2007

APPLICATIONS OF NUMERICAL MATHEMATICS AND SCIENTIFIC COMPUTING TO CHEMICAL ENGINEERING.

MATLAB NUMERICAL METHODS WITH CHEMICAL ENGINEERING APPLICATIONS - KAMAL AL-MALAH 2013-07-31

A PRACTICAL, PROFESSIONAL GUIDE TO MATLAB COMPUTATIONAL TECHNIQUES AND ENGINEERING APPLICATIONS MATLAB NUMERICAL METHODS WITH CHEMICAL ENGINEERING APPLICATIONS SHOWS YOU, STEP BY STEP, HOW TO USE MATLAB® TO MODEL AND SIMULATE PHYSICAL PROBLEMS IN THE CHEMICAL ENGINEERING REALM. WRITTEN FOR MATLAB 7.11, THIS HANDS-ON RESOURCE CONTAINS CONCISE EXPLANATIONS OF ESSENTIAL MATLAB COMMANDS, AS WELL AS EASY-TO-FOLLOW INSTRUCTIONS FOR USING THE PROGRAMMING FEATURES, GRAPHICAL CAPABILITIES, AND

DESKTOP INTERFACE. EVERY STEP NEEDED TOWARD THE FINAL SOLUTION IS ALGORITHMICALLY EXPLAINED VIA SNAPSHOTS OF THE MATLAB PLATFORM IN PARALLEL WITH THE TEXT. END-OF-CHAPTER PROBLEMS HELP YOU PRACTICE WHAT YOU'VE LEARNED. MASTER THIS POWERFUL COMPUTATIONAL TOOL USING THIS DETAILED, SELF-TEACHING GUIDE. COVERAGE INCLUDES: MATLAB BASICS MATRICES MATLAB SCRIPTING LANGUAGE: M-FILE IMAGE AND IMAGE ANALYSIS CURVE-FITTING NUMERICAL INTEGRATION SOLVING DIFFERENTIAL EQUATIONS A SYSTEM OF ALGEBRAIC EQUATIONS STATISTICS CHEMICAL ENGINEERING APPLICATIONS MATLAB GRAPHICAL USER INTERFACE DESIGN ENVIRONMENT (GUIDE)

NUMERICAL TECHNIQUES FOR CHEMICAL AND BIOLOGICAL ENGINEERS USING MATLAB® - SAID S.E.H. ELNASHAIE 2007-03-12

THIS INTERDISCIPLINARY BOOK PRESENTS NUMERICAL TECHNIQUES NEEDED FOR CHEMICAL AND BIOLOGICAL ENGINEERS USING MATLAB. THE BOOK BEGINS BY EXPLORING GENERAL CASES, AND MOVES ON TO SPECIFIC ONES. THE TEXT INCLUDES A LARGE NUMBER OF DETAILED ILLUSTRATIONS, EXERCISES AND INDUSTRIAL EXAMPLES. THE BOOK PROVIDES DETAILED MATHEMATICS AND ENGINEERING BACKGROUND IN THE APPENDIXES, INCLUDING AN INTRODUCTION TO MATLAB. THE TEXT WILL BE USEFUL TO UNDERGRADUATE STUDENTS IN CHEMICAL/BIOLOGICAL ENGINEERING, AND IN APPLIED MATHEMATICS AND NUMERICAL ANALYSIS.

ADSORPTION ANALYSIS: EQUILIBRIA AND KINETICS (WITH CD CONTAINING COMPUTER MATLAB PROGRAMS) - DUONG D Do 1998-09-22

THIS BOOK COVERS TOPICS OF EQUILIBRIA AND KINETICS OF ADSORPTION IN POROUS MEDIA. FUNDAMENTAL EQUILIBRIA AND KINETICS ARE DEALT WITH FOR HOMOGENEOUS AS WELL AS HETEROGENEOUS PARTICLES. FIVE CHAPTERS OF THE BOOK DEAL WITH EQUILIBRIA AND EIGHT CHAPTERS DEAL WITH KINETICS. SINGLE COMPONENT AS WELL AS MULTICOMPONENT SYSTEMS ARE DISCUSSED. IN KINETICS ANALYSIS, WE DEAL WITH THE VARIOUS MASS TRANSPORT PROCESSES AND THEIR INTERACTIONS INSIDE A POROUS PARTICLE. CONVENTIONAL APPROACHES AS WELL AS THE NEW APPROACH USING MAXWELL-STEFAN EQUATIONS ARE PRESENTED. VARIOUS METHODS TO MEASURE DIFFUSIVITY, SUCH AS THE DIFFERENTIAL ADSORPTION BED (DAB), THE TIME LAG, THE DIFFUSION CELL, CHROMATOGRAPHY, AND THE BATCH ADSORBER METHODS ARE ALSO COVERED BY THE BOOK. IT CAN BE USED BY LECTURERS AND ENGINEERS WHO WISH TO CARRY OUT RESEARCH IN ADSORPTION. A NUMBER OF PROGRAMMING CODES WRITTEN IN MATLAB LANGUAGE ARE INCLUDED SO THAT READERS CAN USE THEM DIRECTLY TO BETTER UNDERSTAND THE BEHAVIOR OF SINGLE AND MULTICOMPONENT ADSORPTION SYSTEMS.

PROCESS CONTROL - B. WAYNE BEQUETTE 2003

MASTER PROCESS CONTROL HANDS ON, THROUGH PRACTICAL EXAMPLES AND MATLAB(R) SIMULATIONS THIS IS THE FIRST COMPLETE INTRODUCTION TO PROCESS CONTROL THAT FULLY INTEGRATES SOFTWARE TOOLS--ENABLING PROFESSIONALS AND STUDENTS TO MASTER CRITICAL TECHNIQUES HANDS ON, THROUGH COMPUTER SIMULATIONS BASED ON THE POPULAR MATLAB ENVIRONMENT. PROCESS CONTROL: MODELING,

DESIGN, AND SIMULATION TEACHES THE FIELD'S MOST IMPORTANT TECHNIQUES, BEHAVIORS, AND CONTROL PROBLEMS THROUGH PRACTICAL EXAMPLES, SUPPLEMENTED BY EXTENSIVE EXERCISES--WITH DETAILED DERIVATIONS, RELEVANT SOFTWARE FILES, AND ADDITIONAL TECHNIQUES AVAILABLE ON A COMPANION WEB SITE. COVERAGE INCLUDES: FUNDAMENTALS OF PROCESS CONTROL AND INSTRUMENTATION, INCLUDING OBJECTIVES, VARIABLES, AND BLOCK DIAGRAMS METHODOLOGIES FOR DEVELOPING DYNAMIC MODELS OF CHEMICAL PROCESSES DYNAMIC BEHAVIOR OF LINEAR SYSTEMS: STATE SPACE MODELS, TRANSFER FUNCTION-BASED MODELS, AND MORE FEEDBACK CONTROL; PROPORTIONAL, INTEGRAL, AND DERIVATIVE (PID) CONTROLLERS; AND CLOSED-LOOP STABILITY ANALYSIS FREQUENCY RESPONSE ANALYSIS TECHNIQUES FOR EVALUATING THE ROBUSTNESS OF CONTROL SYSTEMS IMPROVING CONTROL LOOP PERFORMANCE: INTERNAL MODEL CONTROL (IMC), AUTOMATIC TUNING, GAIN SCHEDULING, AND ENHANCEMENTS TO IMPROVE DISTURBANCE REJECTION SPLIT-RANGE, SELECTIVE, AND OVERRIDE STRATEGIES FOR SWITCHING AMONG INPUTS OR OUTPUTS CONTROL LOOP INTERACTIONS AND MULTIVARIABLE CONTROLLERS AN INTRODUCTION TO MODEL PREDICTIVE CONTROL (MPC) BEQUETTE WALKS STEP BY STEP THROUGH THE DEVELOPMENT OF CONTROL INSTRUMENTATION DIAGRAMS FOR AN ENTIRE CHEMICAL PROCESS, REVIEWING COMMON CONTROL STRATEGIES FOR INDIVIDUAL UNIT OPERATIONS, THEN DISCUSSING STRATEGIES FOR INTEGRATED SYSTEMS. THE BOOK ALSO INCLUDES 16 LEARNING MODULES DEMONSTRATING HOW TO USE MATLAB AND SIMULINK TO SOLVE SEVERAL KEY CONTROL PROBLEMS, RANGING FROM ROBUSTNESS ANALYSES TO BIOCHEMICAL REACTORS, BIOMEDICAL PROBLEMS TO MULTIVARIABLE CONTROL.

INTRODUCTION TO SOFTWARE FOR CHEMICAL ENGINEERS - MARIANO MARTIN MARTIN 2014-07-01

THE FIELD OF CHEMICAL ENGINEERING IS IN CONSTANT EVOLUTION, AND ACCESS TO INFORMATION TECHNOLOGY IS CHANGING THE WAY CHEMICAL ENGINEERING PROBLEMS ARE ADDRESSED. INSPIRED BY THE NEED FOR A USER-FRIENDLY CHEMICAL ENGINEERING TEXT THAT DEMONSTRATES THE REAL-WORLD APPLICABILITY OF DIFFERENT COMPUTER PROGRAMS, INTRODUCTION TO SOFTWARE FOR CHEMICAL ENGI
NUMERICAL METHODS FOR CHEMICAL ENGINEERS USING EXCEL, VBA, AND MATLAB - VICTOR J. LAW 2013-03-05
 WHILE TEACHING THE NUMERICAL METHODS FOR ENGINEERS COURSE OVER THE LAST 15 YEARS, THE AUTHOR FOUND A NEED FOR A NEW TEXTBOOK, ONE THAT WAS LESS ELEMENTARY, PROVIDED APPLICATIONS AND PROBLEMS BETTER SUITED FOR CHEMICAL ENGINEERS, AND CONTAINED INSTRUCTION IN VISUAL BASIC® FOR APPLICATIONS (VBA). THIS LED TO SIX YEARS OF DEVELOPING TEACHING NOTES THAT HAVE BEEN ENHANCED TO CREATE THE CURRENT TEXTBOOK, NUMERICAL METHODS FOR CHEMICAL ENGINEERS USING EXCEL®, VBA, AND MATLAB®. FOCUSING ON EXCEL GIVES THE ADVANTAGE OF IT BEING GENERALLY AVAILABLE, SINCE IT IS PRESENT ON EVERY COMPUTER—PC AND MAC—THAT HAS MICROSOFT OFFICE INSTALLED. THE VBA PROGRAMMING ENVIRONMENT COMES WITH EXCEL AND GREATLY ENHANCES THE CAPABILITIES OF EXCEL

SPREADSHEETS. WHILE THERE IS NO PERFECT PROGRAMMING SYSTEM, TEACHING THIS COMBINATION OFFERS KNOWLEDGE IN A WIDELY AVAILABLE PROGRAM THAT IS COMMONLY USED (EXCEL) AS WELL AS A POPULAR ACADEMIC SOFTWARE PACKAGE (MATLAB). CHAPTERS COVER NONLINEAR EQUATIONS, VISUAL BASIC, LINEAR ALGEBRA, ORDINARY DIFFERENTIAL EQUATIONS, REGRESSION ANALYSIS, PARTIAL DIFFERENTIAL EQUATIONS, AND MATHEMATICAL PROGRAMMING METHODS. EACH CHAPTER CONTAINS EXAMPLES THAT SHOW IN DETAIL HOW A PARTICULAR NUMERICAL METHOD OR PROGRAMMING METHODOLOGY CAN BE IMPLEMENTED IN EXCEL AND/OR VBA (OR MATLAB IN CHAPTER 10). MOST OF THE EXAMPLES AND PROBLEMS PRESENTED IN THE TEXT ARE RELATED TO CHEMICAL AND BIOMOLECULAR ENGINEERING AND COVER A BROAD RANGE OF APPLICATION AREAS INCLUDING THERMODYNAMICS, FLUID FLOW, HEAT TRANSFER, MASS TRANSFER, REACTION KINETICS, REACTOR DESIGN, PROCESS DESIGN, AND PROCESS CONTROL. THE CHAPTERS FEATURE "DID YOU KNOW" BOXES, USED TO REMIND READERS OF EXCEL FEATURES. THEY ALSO CONTAIN END-OF-CHAPTER EXERCISES, WITH SOLUTIONS PROVIDED.

EXERCISES SOLUTION MANUAL FOR MATLAB APPLICATIONS IN CHEMICAL ENGINEERING - CHYI-TSONG CHEN 2022-06-30

THIS SELF-STUDY SOLUTION MANUAL IN ACCOMPANY WITH THE BOOK "MATLAB APPLICATIONS IN CHEMICAL ENGINEERING" IS DESIGNED TO PROVIDE READERS WITH THE KEY POINTS OF SOLVING EXERCISE PROBLEMS AT THE END OF EACH CHAPTER, WHICH THEREFORE INSTRUCTIVELY GUIDES READERS TO FAMILIARIZE THEMSELVES WITH THE RELATED MATLAB COMMANDS AND PROGRAMMING METHODS FOR VARIOUS TYPES OF PROBLEMS. ADDITIONALLY, THROUGH THE ASSISTANCE OF THIS SOLUTION MANUAL, THE READERS WOULD PROFOUNDLY STRENGTHEN THE LOGICAL ABILITIES, PROBLEM-SOLVING SKILLS, AND DEEPEN THE APPLICATIONS OF MATLAB PROGRAMMING LANGUAGE TO SOLVE ANALYSIS, DESIGN, SIMULATION AND OPTIMIZATION PROBLEMS AROSE IN RELATED FIELDS OF CHEMICAL ENGINEERING. THE PREPARATION OF THIS MANUAL IS NOT FOR DIRECTLY PROVIDING SOLUTIONS, BUT THROUGH KEY GUIDANCE, OVERVIEW AND ANALYSIS, AND INSTRUCTIONAL SOLUTION-STEPS, TO GRADUALLY CULTIVATE READERS' PROBLEM-SOLVING SKILLS.

PROCESS CONTROL - PAO C. CHAU 2002-08-26

AN INTRODUCTORY 2002 TEXTBOOK, PROCESS CONTROL COVERS THE MOST ESSENTIAL ASPECTS OF PROCESS CONTROL SUITABLE FOR A TWO-SEMESTER COURSE. WHILE CLASSICAL TECHNIQUES ARE DISCUSSED, ALSO INCLUDED IS A DISCUSSION OF STATE SPACE MODELING AND CONTROL, A MODERN CONTROL TOPIC LACKING IN MOST INTRODUCTORY TEXTS. MATLAB, A POPULAR ENGINEERING SOFTWARE PACKAGE, IS EMPLOYED AS A POWERFUL YET APPROACHABLE COMPUTATIONAL TOOL. TEXT EXAMPLES DEMONSTRATE HOW ROOT LOCUS, BODE PLOTS, AND TIME DOMAIN SIMULATIONS CAN BE INTEGRATED TO TACKLE A CONTROL PROBLEM. CLASSICAL CONTROL AND STATE SPACE DESIGNS ARE COMPARED. DESPITE THE RELIANCE ON MATLAB, THEORY AND ANALYSIS OF PROCESS CONTROL ARE WELL-PRESENTED, CREATING A WELL-ROUNDED PEDAGOGICAL TEXT. EACH CHAPTER CONCLUDES WITH PROBLEM SETS, TO WHICH HINTS

OR SOLUTIONS ARE PROVIDED. A WEB SITE PROVIDES EXCELLENT SUPPORT IN THE WAY OF MATLAB OUTPUTS OF TEXT EXAMPLES AND MATLAB SESSIONS, REFERENCES, AND SUPPLEMENTARY NOTES. STUDENTS AND PROFESSIONALS WILL FIND IT A USEFUL TEXT AND REFERENCE.

PROGRAMMING FOR CHEMICAL ENGINEERS USING C, C++, AND MATLAB? - RAUL RAYMOND KAPUNO 2008

DESIGNED FOR CHEMICAL ENGINEERING STUDENTS AND INDUSTRY PROFESSIONALS, THIS BOOK SHOWS HOW TO WRITE REUSABLE COMPUTER PROGRAMS. WRITTEN IN THE THREE LANGUAGES (C, C++, AND MATLAB), IT IS ACCOMPANIED BY A CD-ROM FEATURING SOURCE CODE, EXECUTABLES, FIGURES, AND SIMULATIONS. IT ALSO EXPLAINS EACH PROGRAM IN DETAIL.

FUNDAMENTAL CHEMISTRY WITH MATLAB - DANIELE MAZZA 2022-04-01

FUNDAMENTAL CHEMISTRY WITH MATLAB HIGHLIGHTS HOW MATLAB CAN BE USED TO EXPLORE THE FUNDAMENTALS AND APPLICATIONS OF KEY TOPICS IN CHEMISTRY. AFTER AN INTRODUCTION TO MATLAB, THE BOOK PROVIDES EXAMPLES OF ITS APPLICATION IN BOTH FUNDAMENTAL AND DEVELOPING AREAS OF CHEMISTRY, FROM ATOMIC ORBITALS, CHEMICAL KINETICS AND GASEOUS REACTIONS, TO CLEAN COAL COMBUSTION AND OCEAN EQUILIBRIA, AMONGST OTHERS.

COMPLIMENTARY SCRIPTS AND DATASETS ARE PROVIDED TO SUPPORT EXPERIMENTATION AND LEARNING, WITH SCRIPTS OUTLINED. DRAWING ON THE EXPERIENCE OF EXPERT AUTHORS, THIS BOOK IS A PRACTICAL GUIDE FOR ANYONE IN CHEMISTRY WHO IS INTERESTED HARNESSING SCRIPTS, MODELS AND ALGORITHMS OF THE MATLAB. PROVIDES PRACTICAL EXAMPLES OF USING THE MATLAB PLATFORM TO EXPLORE CONTEMPORARY PROBLEMS IN CHEMISTRY OUTLINES THE USE OF MATLAB SIMULINK TO PRODUCE BLOCK DIAGRAMS FOR DYNAMIC SYSTEMS, SUCH AS IN CHEMICAL REACTION KINETICS HEAVILY ILLUSTRATED WITH SUPPORTIVE BLOCK-DIAGRAMS AND BOTH 2D AND 3D MATLAB PLOTS THROUGHOUT

MASS TRANSFER PROCESSES - P. A. RAMACHANDRAN 2018-02-19

THE ALL-IN-ONE GUIDE TO MASS TRANSPORT PHENOMENA: FROM THEORY TO EXAMPLES AND COMPUTATION MASS TRANSFER PROCESSES EXIST IN PRACTICALLY ALL ENGINEERING FIELDS AND MANY BIOLOGICAL SYSTEMS; UNDERSTANDING THEM IS ESSENTIAL FOR ALL CHEMICAL ENGINEERING STUDENTS, AND FOR PRACTITIONERS IN A BROAD RANGE OF PRACTICES, SUCH AS BIOMEDICAL ENGINEERING, ENVIRONMENTAL ENGINEERING, MATERIAL ENGINEERING, AND THE LIKE. MASS TRANSFER PROCESSES COMBINES A MODERN, ACCESSIBLE INTRODUCTION TO MODELING AND COMPUTING THESE PROCESSES WITH DEMONSTRATIONS OF THEIR APPLICATION IN DESIGNING REACTORS AND SEPARATION SYSTEMS. P. A. RAMACHANDRAN'S INTEGRATED APPROACH BALANCES ALL THE KNOWLEDGE READERS NEED TO BE EFFECTIVE, RATHER THAN MERELY PAYING LIP SERVICE TO SOME CRUCIAL TOPICS. HE COVERS BOTH ANALYTICAL AND NUMERICAL SOLUTIONS TO MASS TRANSFER PROBLEMS, DEMONSTRATING NUMERICAL PROBLEM-SOLVING WITH WIDELY USED SOFTWARE PACKAGES, INCLUDING MATLAB AND CHEBFUN. THROUGHOUT, HE LINKS THEORY TO REALISTIC EXAMPLES, BOTH TRADITIONAL AND CONTEMPORARY. THEORY, EXAMPLES, AND IN-DEPTH

COVERAGE OF DIFFERENTIAL, MACROSCOPIC, AND MESOSCOPIC MODELING PHYSICAL CHEMISTRY ASPECTS OF DIFFUSION PHENOMENA FILM MODELS FOR CALCULATING LOCAL MASS TRANSFER RATES AND DIFFUSIONAL INTERACTION IN GAS-SOLID AND GAS-LIQUID REACTION SYSTEMS APPLICATION OF MASS TRANSFER MODELS IN RATE-BASED SEPARATION PROCESSES, AND SYSTEMS WITH SIMULTANEOUS HEAT AND MASS TRANSFER CONVECTIVE MASS TRANSFER: EMPIRICAL CORRELATION, INTERNAL AND EXTERNAL LAMINAR FLOWS, AND TURBULENT FLOWS HETEROGENEOUS SYSTEMS, FROM LAMINAR FLOW REACTORS, DIFFUSION-REACTION MODELS, REACTIVE MEMBRANES, AND ELECTROCHEMICAL REACTORS COMPUTATIONS OF MASS TRANSFER EFFECTS IN MULTICOMPONENT SYSTEMS SOLID-GAS NONCATALYTIC REACTIONS FOR CHEMICAL, METALLURGICAL, ENVIRONMENTAL, AND ELECTRONIC PROCESSES APPLICATIONS IN ELECTROCHEMICAL AND BIOMEDICAL SYSTEMS DESIGN CALCULATIONS FOR HUMIDIFICATION, DRYING, AND CONDENSATION SYSTEMS AND MEMBRANE-BASED SEPARATIONS ANALYSIS OF ADSORPTION, CHROMATOGRAPHY, ELECTRODIALYSIS, AND ELECTROPHORESIS

PRACTICAL DATA ANALYSIS IN CHEMISTRY - MARCEL MAEDER 2007-08-10

THE MAJORITY OF MODERN INSTRUMENTS ARE COMPUTERISED AND PROVIDE INCREDIBLE AMOUNTS OF DATA. METHODS THAT TAKE ADVANTAGE OF THE FLOOD OF DATA ARE NOW AVAILABLE; IMPORTANTLY THEY DO NOT EMULATE 'GRAPH PAPER ANALYSES' ON THE COMPUTER. MODERN COMPUTATIONAL METHODS ARE ABLE TO GIVE US INSIGHTS INTO DATA, BUT ANALYSIS OR DATA FITTING IN CHEMISTRY REQUIRES THE QUANTITATIVE UNDERSTANDING OF CHEMICAL PROCESSES. THE RESULTS OF THIS ANALYSIS ALLOWS THE MODELLING AND PREDICTION OF PROCESSES UNDER NEW CONDITIONS, THEREFORE SAVING ON EXTENSIVE EXPERIMENTATION. PRACTICAL DATA ANALYSIS IN CHEMISTRY EXEMPLIFIES EVERY ASPECT OF THEORY APPLICABLE TO DATA ANALYSIS USING A SHORT PROGRAM IN A MATLAB OR EXCEL SPREADSHEET, ENABLING THE READER TO STUDY THE PROGRAMS, PLAY WITH THEM AND OBSERVE WHAT HAPPENS. SUITABLE DATA ARE GENERATED FOR EACH EXAMPLE IN SHORT ROUTINES, THIS ENSURING A CLEAR UNDERSTANDING OF THE DATA STRUCTURE. CHAPTER 2 INCLUDES A BRIEF INTRODUCTION TO MATRIX ALGEBRA AND ITS IMPLEMENTATION IN MATLAB AND EXCEL WHILE CHAPTER 3 COVERS THE THEORY REQUIRED FOR THE MODELLING OF CHEMICAL PROCESSES. THIS IS FOLLOWED BY AN INTRODUCTION TO LINEAR AND NON-LINEAR LEAST-SQUARES FITTING, EACH DEMONSTRATED WITH TYPICAL APPLICATIONS. FINALLY CHAPTER 5 COMPRISES A COLLECTION OF SEVERAL METHODS FOR MODEL-FREE DATA ANALYSES. * INCLUDES A SOLID INTRODUCTION TO THE SIMULATION OF EQUILIBRIUM PROCESSES AND THE SIMULATION OF COMPLEX KINETIC PROCESSES. * PROVIDES EXAMPLES OF ROUTINES THAT ARE EASILY ADAPTED TO THE PROCESSES INVESTIGATED BY THE READER * 'MODEL-BASED' ANALYSIS (LINEAR AND NON-LINEAR REGRESSION) AND 'MODEL-FREE' ANALYSIS ARE COVERED

PROCESS DYNAMICS AND CONTROL - BRIAN ROFFEL 2007-01-11

OFFERING A DIFFERENT APPROACH TO OTHER TEXTBOOKS IN

THE AREA, THIS BOOK IS A COMPREHENSIVE INTRODUCTION TO THE SUBJECT DIVIDED IN THREE BROAD PARTS. THE FIRST PART DEALS WITH BUILDING PHYSICAL MODELS, THE SECOND PART WITH DEVELOPING EMPIRICAL MODELS AND THE FINAL PART DISCUSSES DEVELOPING PROCESS CONTROL SOLUTIONS. THEORY IS DISCUSSED WHERE NEEDED TO ENSURE STUDENTS HAVE A FULL UNDERSTANDING OF KEY TECHNIQUES THAT ARE USED TO SOLVE A MODELING PROBLEM. HALLMARK FEATURES: INCLUDES WORKED OUT EXAMPLES OF PROCESSES WHERE THE THEORY LEARNED EARLY ON IN THE TEXT CAN BE APPLIED. USES MATLAB SIMULATION EXAMPLES OF ALL PROCESSES AND MODELING TECHNIQUES- FURTHER INFORMATION ON MATLAB CAN BE OBTAINED FROM WWW.MATHWORKS.COM INCLUDES SUPPLEMENTARY WEBSITE TO INCLUDE FURTHER REFERENCES, WORKED EXAMPLES AND FIGURES FROM THE BOOK THIS BOOK IS STRUCTURED AND AIMED AT UPPER LEVEL UNDERGRADUATE STUDENTS WITHIN CHEMICAL ENGINEERING AND OTHER ENGINEERING DISCIPLINES LOOKING FOR A COMPREHENSIVE INTRODUCTION TO THE SUBJECT. IT IS ALSO OF USE TO PRACTITIONERS OF PROCESS CONTROL WHERE THE INTEGRATED APPROACH OF PHYSICAL AND EMPIRICAL MODELING IS PARTICULARLY VALUABLE.

STATISTICS FOR CHEMICAL AND PROCESS ENGINEERS - YURI A.W. SHARDT 2015-10-16

A COHERENT, CONCISE AND COMPREHENSIVE COURSE IN THE STATISTICS NEEDED FOR A MODERN CAREER IN CHEMICAL ENGINEERING; COVERS ALL OF THE CONCEPTS REQUIRED FOR THE AMERICAN FUNDAMENTALS OF ENGINEERING EXAMINATION. THIS BOOK SHOWS THE READER HOW TO DEVELOP AND TEST MODELS, DESIGN EXPERIMENTS AND ANALYSE DATA IN WAYS EASILY APPLICABLE THROUGH READILY AVAILABLE SOFTWARE TOOLS LIKE MS EXCEL® AND MATLAB®. GENERALIZED METHODS THAT CAN BE APPLIED IRRESPECTIVE OF THE TOOL AT HAND ARE A KEY FEATURE OF THE TEXT. THE READER IS GIVEN A DETAILED FRAMEWORK FOR STATISTICAL PROCEDURES COVERING: * DATA VISUALIZATION; * PROBABILITY; * LINEAR AND NONLINEAR REGRESSION; * EXPERIMENTAL DESIGN (INCLUDING FACTORIAL AND FRACTIONAL FACTORIAL DESIGNS); AND * DYNAMIC PROCESS IDENTIFICATION. MAIN CONCEPTS ARE ILLUSTRATED WITH CHEMICAL- AND PROCESS-ENGINEERING-RELEVANT EXAMPLES THAT CAN ALSO SERVE AS THE BASES FOR CHECKING ANY SUBSEQUENT REAL IMPLEMENTATIONS. QUESTIONS ARE PROVIDED (WITH SOLUTIONS AVAILABLE FOR INSTRUCTORS) TO CONFIRM THE CORRECT USE OF NUMERICAL TECHNIQUES, AND TEMPLATES FOR USE IN MS EXCEL AND MATLAB CAN ALSO BE DOWNLOADED FROM EXTRAS.SPRINGER.COM. WITH ITS INTEGRATIVE APPROACH TO SYSTEM IDENTIFICATION, REGRESSION AND STATISTICAL THEORY, STATISTICS FOR CHEMICAL AND PROCESS ENGINEERS PROVIDES AN EXCELLENT MEANS OF REVISION AND SELF-STUDY FOR CHEMICAL AND PROCESS ENGINEERS WORKING IN EXPERIMENTAL ANALYSIS AND DESIGN IN PETROCHEMICALS, CERAMICS, OIL AND GAS, AUTOMOTIVE AND SIMILAR INDUSTRIES AND INVALUABLE INSTRUCTION TO ADVANCED UNDERGRADUATE AND GRADUATE STUDENTS LOOKING TO BEGIN A CAREER IN THE PROCESS INDUSTRIES.

INTRODUCTION TO MATLAB FOR CHEMICAL & PETROLEUM ENGINEERING - SAM TOAN 2017-07-30

FOR ENGINEERS TODAY, THE IMPORTANCE OF MASTERING COMPUTER-AIDED CALCULATIONS IS BECOMING INCREASINGLY EVIDENT. UNIVERSITIES AROUND THE WORLD RECOGNIZE THE DISCIPLINE AS ESSENTIAL TO SUCCESS AS AN ENGINEER AND, IN TURN, OFFER AN ARRAY OF COURSES TO HELP ENGINEERING STUDENTS BECOME COMFORTABLE USING COMPUTATIONAL METHODS. THE PURPOSE OF THIS BOOK IS TO SERVE AS A USEFUL REFERENCE AND GUIDE AS STUDENTS-SPECIFICALLY CHEMICAL AND PETROLEUM ENGINEERING MAJORS-LEARN COMPUTATIONAL PROGRAMMING USING MATLAB. MATLAB IS A VERY ROBUST PROGRAM WITH VARIOUS BUILT-IN ANALYTICAL FUNCTIONS AND EASY-TO-USE PLOTTING TOOLS. MATLAB'S CAPABILITIES, FEATURES, AND INTUITIVE DESIGN MAKE IT AN EXCEPTIONAL COMPUTATIONAL TOOL FOR UNDERGRADUATE-LEVEL ENGINEERING STUDENTS. THE CHAPTERS CONTAINED IN THIS BOOK COVER MOST OF THE TOPICS IN REQUIRED CHEMICAL AND PETROLEUM ENGINEERING COURSES. IN CHAPTERS 1 THROUGH 5, WE INTRODUCE THE READER TO THE BASICS OF PROGRAMING AND PLOTTING IN MATLAB. IN CHAPTER 6, STUDENTS LEARN HOW TO USE MATLAB TO SOLVE LINEAR AND NON-LINEAR EQUATIONS, AND SYSTEMS OF EQUATIONS. WE COVER CURVE FITTING AND INTERPOLATION IN CHAPTER 7. THE FOCUS OF THE FINAL CHAPTERS SHIFTS TO DIFFERENTIATION, INTEGRATION, AND SOLVING ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS. WE PROVIDE CHEMICAL AND PETROLEUM ENGINEERING RELATED EXAMPLES IN EACH CHAPTER. ALONG THE WAY, WE ALSO DISCUSS VARIOUS NUMERICAL METHODS THAT CAN BE APPLIED AT BOTH THE UNDERGRADUATE AND GRADUATE LEVELS. WE, THE AUTHORS, HOPE THAT THIS BOOK WILL BE HELPFUL TO ENGINEERING STUDENTS AND INSTRUCTORS ALIKE.

MATLAB APPLICATIONS IN CHEMICAL ENGINEERING - CHYI-TSONG CHEN 2022-05-20

THIS BOOK ADDRESSES THE APPLICATIONS OF MATLAB® AND SIMULINK IN THE SOLUTION OF CHEMICAL ENGINEERING PROBLEMS. BY CLASSIFYING THE PROBLEMS INTO SEVEN DIFFERENT CATEGORIES, THE AUTHOR ORGANIZES THIS BOOK AS FOLLOWS: CHAPTER ONE - SOLUTION OF A SYSTEM OF LINEAR EQUATIONS CHAPTER TWO - SOLUTION OF NONLINEAR EQUATIONS CHAPTER THREE - INTERPOLATION, DIFFERENTIATION AND INTEGRATION CHAPTER FOUR- NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS CHAPTER FIVE - NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS CHAPTER SIX - PROCESS OPTIMIZATION CHAPTER SEVEN - PARAMETER ESTIMATION EACH CHAPTER IS ARRANGED IN FOUR MAJOR PARTS. IN THE FIRST PART, THE BASIC PROBLEM PATTERNS THAT CAN BE SOLVED WITH MATLAB® ARE PRESENTED. THE SECOND PART DESCRIBES HOW TO APPLY MATLAB® COMMANDS TO SOLVE THE FORMULATED PROBLEMS IN THE FIELD OF CHEMICAL ENGINEERING. IN THE THIRD AND THE FOURTH PARTS, EXERCISES AND SUMMARY OF MATLAB® INSTRUCTIONS ARE PROVIDED, RESPECTIVELY. THE DESCRIPTION OF THE CHEMICAL ENGINEERING EXAMPLE FOLLOWS THE SEQUENCE OF PROBLEM FORMULATION, MODEL ANALYSIS, MATLAB® PROGRAM DESIGN, EXECUTION RESULTS, AND DISCUSSION. IN THIS WAY, LEARNERS ARE FIRST AWARE OF THE BASIC PROBLEM PATTERNS AND THE UNDERLYING CHEMICAL ENGINEERING PRINCIPLES, FOLLOWED BY FURTHER FAMILIARIZING THEMSELVES WITH THE

RELEVANT MATLAB® INSTRUCTIONS AND PROGRAMMING SKILLS. READERS ARE ENCOURAGED TO DO EXERCISES TO PRACTICE THEIR PROBLEM-SOLVING SKILLS AND DEEPEN THE FUNDAMENTAL KNOWLEDGE OF CHEMICAL ENGINEERING AND RELEVANT APPLICATION PROBLEMS. THE TABLE OF CONTENTS IS LISTED BELOW: CHAPTER 1: SOLUTION OF A SYSTEM OF LINEAR EQUATIONS 1 1.1 PROPERTIES OF LINEAR EQUATION SYSTEMS AND THE RELEVANT MATLAB COMMANDS 1 1.2 CHEMICAL ENGINEERING EXAMPLES 10 1.3 EXERCISES 43 1.4 SUMMARY OF THE MATLAB COMMANDS RELATED TO THIS CHAPTER 48 CHAPTER 2: SOLUTION OF NONLINEAR EQUATIONS 51 2.1 RELEVANT MATLAB COMMANDS AND THE SIMULINK SOLUTION INTERFACE 51 2.2 CHEMICAL ENGINEERING EXAMPLES 70 2.3 EXERCISES 103 2.4 SUMMARY OF MATLAB COMMANDS RELATED TO THIS CHAPTER 122 CHAPTER 3: INTERPOLATION, DIFFERENTIATION, AND INTEGRATION 125 3.1 INTERPOLATION COMMANDS IN MATLAB 125 3.2 NUMERICAL DIFFERENTIATION 131 3.3 NUMERICAL INTEGRATION 153 3.4 CHEMICAL ENGINEERING EXAMPLES 157 3.5 EXERCISES 183 3.6 SUMMARY OF THE MATLAB COMMANDS RELATED TO THIS CHAPTER 195 CHAPTER 4: NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS 197 4.1 INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS 197 4.2 HIGHER-ORDER ORDINARY DIFFERENTIAL EQUATIONS 222 4.3 STIFF DIFFERENTIAL EQUATIONS 227 4.4 DIFFERENTIAL-ALGEBRAIC EQUATION SYSTEM 232 4.5 BOUNDARY-VALUED ORDINARY DIFFERENTIAL EQUATIONS 236 4.6 CHEMICAL ENGINEERING EXAMPLES 254 4.7 EXERCISES 285 4.8 SUMMARY OF THE MATLAB COMMANDS RELATED TO THIS CHAPTER 308 CHAPTER 5: NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS 311 5.1 CLASSIFICATIONS OF PDEs 311 5.2 THE MATLAB PDE TOOLBOX 316 5.3 CHEMICAL ENGINEERING EXAMPLES 341 5.4 EXERCISES 388 5.5 SUMMARY OF THE MATLAB COMMANDS RELATED TO THIS CHAPTER 397 CHAPTER 6: PROCESS OPTIMIZATION 399 6.1 THE OPTIMIZATION PROBLEM AND THE RELEVANT MATLAB COMMANDS 399 6.2 CHEMICAL ENGINEERING EXAMPLES 448 6.3 EXERCISES 481 6.4 SUMMARY OF THE MATLAB COMMANDS RELATED TO THIS CHAPTER 501 CHAPTER 7: PARAMETER ESTIMATION 503 7.1 PARAMETER ESTIMATION USING THE LEAST-SQUARES METHOD 503 7.2 CHEMICAL ENGINEERING EXAMPLES 517 7.3 EXERCISES 549 7.4 SUMMARY OF THE MATLAB COMMANDS RELATED TO THIS CHAPTER 560 REFERENCES 563 INDEX 569

OPTIMIZATION IN CHEMICAL ENGINEERING - SUMAN DUTTA 2016-03-11

OPTIMIZATION IS USED TO DETERMINE THE MOST APPROPRIATE VALUE OF VARIABLES UNDER GIVEN CONDITIONS. THE PRIMARY FOCUS OF USING OPTIMISATION TECHNIQUES IS TO MEASURE THE MAXIMUM OR MINIMUM VALUE OF A FUNCTION DEPENDING ON THE CIRCUMSTANCES. THIS BOOK DISCUSSES PROBLEM FORMULATION AND PROBLEM SOLVING WITH THE HELP OF ALGORITHMS SUCH AS SECANT METHOD, QUASI-NEWTON METHOD, LINEAR PROGRAMMING AND DYNAMIC PROGRAMMING. IT ALSO EXPLAINS IMPORTANT CHEMICAL PROCESSES SUCH AS FLUID FLOW SYSTEMS, HEAT EXCHANGERS, CHEMICAL REACTORS AND DISTILLATION SYSTEMS USING SOLVED

EXAMPLES. THE BOOK BEGINS BY EXPLAINING THE FUNDAMENTAL CONCEPTS FOLLOWED BY AN ELUCIDATION OF VARIOUS MODERN TECHNIQUES INCLUDING TRUST-REGION METHODS, LEVENBERG-MARQUARDT ALGORITHMS, STOCHASTIC OPTIMIZATION, SIMULATED ANNEALING AND STATISTICAL OPTIMIZATION. IT STUDIES THE MULTI-OBJECTIVE OPTIMIZATION TECHNIQUE AND ITS APPLICATIONS IN CHEMICAL ENGINEERING AND ALSO DISCUSSES THE THEORY AND APPLICATIONS OF VARIOUS OPTIMIZATION SOFTWARE TOOLS INCLUDING LINGO, MATLAB, MINITAB AND GAMS.

CHEMICAL ENGINEERING COMPUTATION WITH MATLAB® - YEONG KOO YEO 2020-12-15

CHEMICAL ENGINEERING COMPUTATION WITH MATLAB®, SECOND EDITION CONTINUES TO PRESENT BASIC TO ADVANCED LEVELS OF PROBLEM-SOLVING TECHNIQUES USING MATLAB AS THE COMPUTATION ENVIRONMENT. THE SECOND EDITION PROVIDES EVEN MORE EXAMPLES AND PROBLEMS EXTRACTED FROM CORE CHEMICAL ENGINEERING SUBJECT AREAS AND ALL CODE IS UPDATED TO MATLAB VERSION 2020. IT ALSO INCLUDES A NEW CHAPTER ON COMPUTATIONAL INTELLIGENCE AND: OFFERS EXERCISES AND EXTENSIVE PROBLEM-SOLVING INSTRUCTION AND SOLUTIONS FOR VARIOUS PROBLEMS FEATURES SOLUTIONS DEVELOPED USING FUNDAMENTAL PRINCIPLES TO CONSTRUCT MATHEMATICAL MODELS AND AN EQUATION-ORIENTED APPROACH TO GENERATE NUMERICAL RESULTS DELIVERS A WEALTH OF EXAMPLES TO DEMONSTRATE THE IMPLEMENTATION OF VARIOUS PROBLEM-SOLVING APPROACHES AND METHODOLOGIES FOR PROBLEM FORMULATION, PROBLEM SOLVING, ANALYSIS, AND PRESENTATION, AS WELL AS VISUALIZATION AND DOCUMENTATION OF RESULTS INCLUDES AN APPENDIX OFFERING AN INTRODUCTION TO MATLAB FOR READERS UNFAMILIAR WITH THE PROGRAM, WHICH WILL ALLOW THEM TO WRITE THEIR OWN MATLAB PROGRAMS AND FOLLOW THE EXAMPLES IN THE BOOK PROVIDES AID WITH ADVANCED PROBLEMS THAT ARE OFTEN ENCOUNTERED IN GRADUATE RESEARCH AND INDUSTRIAL OPERATIONS, SUCH AS NONLINEAR REGRESSION, PARAMETER ESTIMATION IN DIFFERENTIAL SYSTEMS, TWO-POINT BOUNDARY VALUE PROBLEMS AND PARTIAL DIFFERENTIAL EQUATIONS AND OPTIMIZATION THIS ESSENTIAL TEXTBOOK READIES ENGINEERING STUDENTS, RESEARCHERS, AND PROFESSIONALS TO BE PROFICIENT IN THE USE OF MATLAB TO SOLVE SOPHISTICATED REAL-WORLD PROBLEMS WITHIN THE INTERDISCIPLINARY FIELD OF CHEMICAL ENGINEERING. THE TEXT FEATURES A SOLUTIONS MANUAL, LECTURE SLIDES, AND MATLAB PROGRAM FILES._

PROBLEM SOLVING IN CHEMICAL AND BIOCHEMICAL ENGINEERING WITH POLYMATH, EXCEL, AND MATLAB - MICHAEL B. CUTLIP 2008

PROBLEM SOLVING IN CHEMICAL AND BIOCHEMICAL ENGINEERING WITH POLYMATH™, EXCEL, AND MATLAB™, SECOND EDITION, IS A VALUABLE RESOURCE AND COMPANION THAT INTEGRATES THE USE OF NUMERICAL PROBLEM SOLVING IN THE THREE MOST WIDELY USED SOFTWARE PACKAGES: POLYMATH, MICROSOFT EXCEL, AND MATLAB. RECENTLY DEVELOPED POLYMATH CAPABILITIES ALLOW THE AUTOMATIC CREATION OF EXCEL SPREADSHEETS AND THE

GENERATION OF MATLAB CODE FOR PROBLEM SOLUTIONS. STUDENTS AND PROFESSIONAL ENGINEERS WILL APPRECIATE THE EASE WITH WHICH PROBLEMS CAN BE ENTERED INTO POLYMATH AND THEN SOLVED INDEPENDENTLY IN ALL THREE SOFTWARE PACKAGES, WHILE TAKING FULL ADVANTAGE OF THE UNIQUE CAPABILITIES WITHIN EACH PACKAGE. THE BOOK INCLUDES MORE THAN 170 PROBLEMS REQUIRING NUMERICAL SOLUTIONS. THIS GREATLY EXPANDED AND REVISED SECOND EDITION INCLUDES NEW CHAPTERS ON GETTING STARTED WITH AND USING EXCEL AND MATLAB. IT ALSO PLACES SPECIAL EMPHASIS ON BIOCHEMICAL ENGINEERING WITH A MAJOR CHAPTER ON THE SUBJECT AND WITH THE INTEGRATION OF BIOCHEMICAL PROBLEMS THROUGHOUT THE BOOK. GENERAL TOPICS AND SUBJECT AREAS, ORGANIZED BY CHAPTER

INTRODUCTION TO PROBLEM SOLVING WITH MATHEMATICAL SOFTWARE PACKAGES BASIC PRINCIPLES AND CALCULATIONS REGRESSION AND CORRELATION OF DATA INTRODUCTION TO PROBLEM SOLVING WITH EXCEL INTRODUCTION TO PROBLEM SOLVING WITH MATLAB ADVANCED PROBLEM-SOLVING TECHNIQUES THERMODYNAMICS FLUID MECHANICS HEAT TRANSFER MASS TRANSFER CHEMICAL REACTION ENGINEERING PHASE EQUILIBRIUM AND DISTILLATION PROCESS DYNAMICS AND CONTROL BIOCHEMICAL ENGINEERING PRACTICAL ASPECTS OF PROBLEM-SOLVING CAPABILITIES SIMULTANEOUS LINEAR EQUATIONS SIMULTANEOUS NONLINEAR EQUATIONS LINEAR, MULTIPLE LINEAR, AND NONLINEAR REGRESSIONS WITH STATISTICAL ANALYSES PARTIAL DIFFERENTIAL EQUATIONS (USING THE NUMERICAL METHOD OF LINES) CURVE FITTING BY POLYNOMIALS WITH STATISTICAL ANALYSIS SIMULTANEOUS ORDINARY DIFFERENTIAL EQUATIONS (INCLUDING PROBLEMS INVOLVING STIFF SYSTEMS, DIFFERENTIAL-ALGEBRAIC EQUATIONS, AND PARAMETER ESTIMATION IN SYSTEMS OF ORDINARY DIFFERENTIAL EQUATIONS) THE BOOK'S WEB SITE ([HTTP://WWW.PROBLEMSOLVINGBOOK.COM](http://www.problemsolvingbook.com)) PROVIDES SOLVED AND PARTIALLY SOLVED PROBLEM FILES FOR ALL THREE SOFTWARE PACKAGES, PLUS ADDITIONAL MATERIALS DESCRIBES DISCOUNTED PURCHASE OPTIONS FOR EDUCATIONAL VERSION OF POLYMATH AVAILABLE TO BOOK PURCHASERS INCLUDES DETAILED, SELECTED PROBLEM SOLUTIONS IN MAPLE", MATHCAD, AND MATHEMATICA"

PROCESS MODELLING AND SIMULATION IN CHEMICAL, BIOCHEMICAL AND ENVIRONMENTAL ENGINEERING - ASHOK KUMAR VERMA 2014-10-17

THE USE OF SIMULATION PLAYS A VITAL PART IN DEVELOPING AN INTEGRATED APPROACH TO PROCESS DESIGN. BY HELPING SAVE TIME AND MONEY BEFORE THE ACTUAL TRIAL OF A CONCEPT, THIS PRACTICE CAN ASSIST WITH TROUBLESHOOTING, DESIGN, CONTROL, REVAMPING, AND MORE. PROCESS MODELLING AND SIMULATION IN CHEMICAL, BIOCHEMICAL AND ENVIRONMENTAL ENGINEERING EXPLORES EF

MATHEMATICAL MODELLING AND SIMULATION IN CHEMICAL ENGINEERING - M. CHIDAMBARAM 2018-03-09

AN EASY TO UNDERSTAND GUIDE COVERING KEY PRINCIPLES OF MATHEMATICAL MODELLING AND SIMULATION IN CHEMICAL ENGINEERING.

NUMERICAL METHODS FOR CHEMICAL ENGINEERS WITH MATLAB APPLICATIONS - A. CONSTANTINIDES 1999

MASTER NUMERICAL METHODS USING MATLAB, TODAY'S

LEADING SOFTWARE FOR PROBLEM SOLVING. THIS COMPLETE GUIDE TO NUMERICAL METHODS IN CHEMICAL ENGINEERING IS THE FIRST TO TAKE FULL ADVANTAGE OF MATLAB'S POWERFUL CALCULATION ENVIRONMENT. EVERY CHAPTER CONTAINS SEVERAL EXAMPLES USING GENERAL MATLAB FUNCTIONS THAT IMPLEMENT THE METHOD AND CAN ALSO BE APPLIED TO MANY OTHER PROBLEMS IN THE SAME CATEGORY. THE AUTHORS BEGIN BY INTRODUCING THE SOLUTION OF NONLINEAR EQUATIONS USING SEVERAL STANDARD APPROACHES, INCLUDING METHODS OF SUCCESSIVE SUBSTITUTION AND LINEAR INTERPOLATION; THE WEGSTEIN METHOD, THE NEWTON-RAPHSON METHOD; THE EIGENVALUE METHOD; AND SYNTHETIC DIVISION ALGORITHMS. WITH THESE FUNDAMENTALS IN HAND, THEY MOVE ON TO SIMULTANEOUS LINEAR ALGEBRAIC EQUATIONS, COVERING MATRIX AND VECTOR OPERATIONS; CRAMER'S RULE; GAUSS METHODS; THE JACOBI METHOD; AND THE CHARACTERISTIC-VALUE PROBLEM. ADDITIONAL COVERAGE INCLUDES: FINITE DIFFERENCE METHODS, AND INTERPOLATION OF EQUALLY AND UNEQUALLY SPACED POINTS NUMERICAL DIFFERENTIATION AND INTEGRATION, INCLUDING DIFFERENTIATION BY BACKWARD, FORWARD, AND CENTRAL FINITE DIFFERENCES; NEWTON-COTES FORMULAS; AND THE GAUSS QUADRATURE TWO DETAILED CHAPTERS ON ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS LINEAR AND NONLINEAR REGRESSION ANALYSES, INCLUDING LEAST SQUARES, ESTIMATED VECTOR OF PARAMETERS, METHOD OF STEEPEST DESCENT, GAUSS-NEWTON METHOD, MARQUARDT METHOD, NEWTON METHOD, AND MULTIPLE NONLINEAR REGRESSION THE NUMERICAL METHODS COVERED HERE REPRESENT VIRTUALLY ALL OF THOSE COMMONLY USED BY PRACTICING CHEMICAL ENGINEERS. THE FOCUS ON MATLAB ENABLES READERS TO ACCOMPLISH MORE, WITH LESS COMPLEXITY, THAN WAS POSSIBLE WITH TRADITIONAL FORTRAN. FOR THOSE UNFAMILIAR WITH MATLAB, A BRIEF INTRODUCTION IS PROVIDED AS AN APPENDIX. OVER 60+ MATLAB EXAMPLES, METHODS, AND FUNCTION SCRIPTS ARE COVERED, AND ALL OF THEM ARE INCLUDED ON THE BOOK'S CD

MEMBRANE FILTRATION - GREG FOLEY 2013-07-04

FOCUSING ON THE APPLICATION OF MEMBRANES IN AN ENGINEERING CONTEXT, THIS HANDS-ON COMPUTATIONAL GUIDE MAKES PREVIOUSLY CHALLENGING PROBLEMS ROUTINE. IT FORMULATES PROBLEMS AS SYSTEMS OF EQUATIONS SOLVED WITH MATLAB, ENCOURAGING ACTIVE LEARNING THROUGH WORKED EXAMPLES AND END-OF-CHAPTER PROBLEMS. THE DETAILED TREATMENTS OF DEAD-END FILTRATION INCLUDE NOVEL APPROACHES TO CONSTANT RATE FILTRATION AND FILTRATION WITH A CENTRIFUGAL PUMP. THE DISCUSSION OF CROSSFLOW MICROFILTRATION INCLUDES THE USE OF KINETIC AND FORCE BALANCE MODELS. COMPREHENSIVE COVERAGE OF ULTRAFILTRATION AND DIAFILTRATION PROCESSES EMPLOYS BOTH LIMITING FLUX AND OSMOTIC PRESSURE MODELS. THE EFFECT OF FLUID VISCOSITY ON THE MASS TRANSFER COEFFICIENT IS EXPLORED IN DETAIL, THE EFFECTS OF INCOMPLETE REJECTION ON THE DESIGN AND ANALYSIS OF ULTRAFILTRATION AND DIAFILTRATION ARE ANALYSED, AND QUANTITATIVE TREATMENTS OF REVERSE OSMOSIS AND NANOFILTRATION PROCESS ANALYSIS AND DESIGN ARE EXPLORED. INCLUDES A CHAPTER DEDICATED TO

THE MODELLING OF MEMBRANE FOULING.

INTRODUCTORY CHEMICAL ENGINEERING THERMODYNAMICS - J. RICHARD ELLIOTT 2012-02-06

A PRACTICAL, UP-TO-DATE INTRODUCTION TO APPLIED THERMODYNAMICS, INCLUDING COVERAGE OF PROCESS SIMULATION MODELS AND AN INTRODUCTION TO BIOLOGICAL SYSTEMS INTRODUCTORY CHEMICAL ENGINEERING THERMODYNAMICS, SECOND EDITION, HELPS READERS MASTER THE FUNDAMENTALS OF APPLIED THERMODYNAMICS AS PRACTICED TODAY: WITH EXTENSIVE DEVELOPMENT OF MOLECULAR PERSPECTIVES THAT ENABLES ADAPTATION TO FIELDS INCLUDING BIOLOGICAL SYSTEMS, ENVIRONMENTAL APPLICATIONS, AND NANOTECHNOLOGY. THIS TEXT IS DISTINCTIVE IN MAKING MOLECULAR PERSPECTIVES ACCESSIBLE AT THE INTRODUCTORY LEVEL AND CONNECTING PROPERTIES WITH PRACTICAL IMPLICATIONS. FEATURES OF THE SECOND EDITION INCLUDE HIERARCHICAL INSTRUCTION WITH INCREASING LEVELS OF DETAIL: CONTENT REQUIRING DEEPER LEVELS OF THEORY IS CLEARLY DELINEATED IN SEPARATE SECTIONS AND CHAPTERS EARLY INTRODUCTION TO THE OVERALL PERSPECTIVE OF COMPOSITE SYSTEMS LIKE DISTILLATION COLUMNS, REACTIVE PROCESSES, AND BIOLOGICAL SYSTEMS LEARNING OBJECTIVES, PROBLEM-SOLVING STRATEGIES FOR ENERGY BALANCES AND PHASE EQUILIBRIA, CHAPTER SUMMARIES, AND "IMPORTANT EQUATIONS" FOR EVERY CHAPTER EXTENSIVE PRACTICAL EXAMPLES, ESPECIALLY COVERAGE OF NON-IDEAL MIXTURES, WHICH INCLUDE WATER CONTAMINATION VIA HYDROCARBONS, POLYMER BLENDING/RECYCLING, OXYGENATED FUELS, HYDROGEN BONDING, OSMOTIC PRESSURE, ELECTROLYTE SOLUTIONS, ZWITTERIONS AND BIOLOGICAL MOLECULES, AND OTHER CONTEMPORARY ISSUES SUPPORTING SOFTWARE IN FORMATS FOR BOTH MATLAB® AND SPREADSHEETS ONLINE SUPPLEMENTAL SECTIONS AND RESOURCES INCLUDING INSTRUCTOR SLIDES, CONCEPT TESTS, COURSECAST VIDEOS, AND OTHER USEFUL RESOURCES

APPLICATIONS OF MATLAB IN SCIENCE AND ENGINEERING - TADEUSZ MICHALOWSKI 2011-09-09

THE BOOK CONSISTS OF 24 CHAPTERS ILLUSTRATING A WIDE RANGE OF AREAS WHERE MATLAB TOOLS ARE APPLIED. THESE AREAS INCLUDE MATHEMATICS, PHYSICS, CHEMISTRY AND CHEMICAL ENGINEERING, MECHANICAL ENGINEERING, BIOLOGICAL (MOLECULAR BIOLOGY) AND MEDICAL SCIENCES, COMMUNICATION AND CONTROL SYSTEMS, DIGITAL SIGNAL, IMAGE AND VIDEO PROCESSING, SYSTEM MODELING AND SIMULATION. MANY INTERESTING PROBLEMS HAVE BEEN INCLUDED THROUGHOUT THE BOOK, AND ITS CONTENTS WILL BE BENEFICIAL FOR STUDENTS AND PROFESSIONALS IN WIDE AREAS OF INTEREST.

INTRODUCTION TO SOFTWARE FOR CHEMICAL ENGINEERS, SECOND EDITION - MARIANO MARTÍN MARTÍN 2019-06-06

THE FIELD OF CHEMICAL ENGINEERING AND ITS LINK TO COMPUTER SCIENCE IS IN CONSTANT EVOLUTION AND NEW ENGINEERS HAVE A VARIETY OF TOOLS AT THEIR DISPOSAL TO TACKLE THEIR EVERYDAY PROBLEMS. INTRODUCTION TO SOFTWARE FOR CHEMICAL ENGINEERS, SECOND EDITION PROVIDES A QUICK GUIDE TO THE USE OF VARIOUS COMPUTER PACKAGES FOR CHEMICAL ENGINEERING APPLICATIONS. IT

COVERS A RANGE OF SOFTWARE APPLICATIONS FROM EXCEL AND GENERAL MATHEMATICAL PACKAGES SUCH AS MATLAB AND MATHCAD TO PROCESS SIMULATORS, CHEMCAD AND ASPEN, EQUATION-BASED MODELING LANGUAGES, gPROMS, OPTIMIZATION SOFTWARE SUCH AS GAMS AND AIMS, AND SPECIALIZED SOFTWARE LIKE CFD OR DEM CODES. THE DIFFERENT PACKAGES ARE INTRODUCED AND APPLIED TO SOLVE TYPICAL PROBLEMS IN FLUID MECHANICS, HEAT AND MASS TRANSFER, MASS AND ENERGY BALANCES, UNIT OPERATIONS, REACTOR ENGINEERING, PROCESS AND EQUIPMENT DESIGN AND CONTROL. THIS NEW EDITION OFFERS A WIDER VIEW OF PACKAGES INCLUDING OPEN SOURCE SOFTWARE SUCH AS R, PYTHON AND JULIA. IT ALSO INCLUDES COMPLETE EXAMPLES IN ASPEN PLUS, ADDS ANSYS FLUENT TO CFD CODES, LINGO TO THE OPTIMIZATION PACKAGES, AND DISCUSSES ENGINEERING EQUATION SOLVER. IT OFFERS A GLOBAL IDEA OF THE CAPABILITIES OF THE SOFTWARE USED IN THE CHEMICAL ENGINEERING FIELD AND PROVIDES EXAMPLES FOR SOLVING REAL-WORLD PROBLEMS. WRITTEN BY LEADING EXPERTS, THIS BOOK IS A MUST-HAVE REFERENCE FOR CHEMICAL ENGINEERS LOOKING TO GROW IN THEIR CAREERS THROUGH THE USE OF NEW AND IMPROVING COMPUTER SOFTWARE. ITS USER-FRIENDLY APPROACH TO SIMULATION AND OPTIMIZATION AS WELL AS ITS EXAMPLE-BASED PRESENTATION OF THE SOFTWARE, MAKES IT A PERFECT TEACHING TOOL FOR BOTH UNDERGRADUATE AND MASTER LEVELS.

CHEMICAL ENGINEERING COMPUTATION WITH MATLAB® - YEONG KOO YEO 2020-12-16

CHEMICAL ENGINEERING COMPUTATION WITH MATLAB®, SECOND EDITION CONTINUES TO PRESENT BASIC TO ADVANCED LEVELS OF PROBLEM-SOLVING TECHNIQUES USING MATLAB AS THE COMPUTATION ENVIRONMENT. THE SECOND EDITION PROVIDES EVEN MORE EXAMPLES AND PROBLEMS EXTRACTED FROM CORE CHEMICAL ENGINEERING SUBJECT AREAS AND ALL CODE IS UPDATED TO MATLAB VERSION 2020. IT ALSO INCLUDES A NEW CHAPTER ON COMPUTATIONAL INTELLIGENCE AND: OFFERS EXERCISES AND EXTENSIVE PROBLEM-SOLVING INSTRUCTION AND SOLUTIONS FOR VARIOUS PROBLEMS FEATURES SOLUTIONS DEVELOPED USING FUNDAMENTAL PRINCIPLES TO CONSTRUCT MATHEMATICAL MODELS AND AN EQUATION-ORIENTED APPROACH TO GENERATE NUMERICAL RESULTS DELIVERS A WEALTH OF EXAMPLES TO DEMONSTRATE THE IMPLEMENTATION OF VARIOUS PROBLEM-SOLVING APPROACHES AND METHODOLOGIES FOR PROBLEM FORMULATION, PROBLEM SOLVING, ANALYSIS, AND PRESENTATION, AS WELL AS VISUALIZATION AND DOCUMENTATION OF RESULTS INCLUDES AN APPENDIX OFFERING AN INTRODUCTION TO MATLAB FOR READERS UNFAMILIAR WITH THE PROGRAM, WHICH WILL ALLOW THEM TO WRITE THEIR OWN MATLAB PROGRAMS AND FOLLOW THE EXAMPLES IN THE BOOK PROVIDES AID WITH ADVANCED PROBLEMS THAT ARE OFTEN ENCOUNTERED IN GRADUATE RESEARCH AND INDUSTRIAL OPERATIONS, SUCH AS NONLINEAR REGRESSION, PARAMETER ESTIMATION IN DIFFERENTIAL SYSTEMS, TWO-POINT BOUNDARY VALUE PROBLEMS AND PARTIAL DIFFERENTIAL EQUATIONS AND OPTIMIZATION THIS ESSENTIAL TEXTBOOK READIES ENGINEERING STUDENTS, RESEARCHERS, AND PROFESSIONALS TO BE PROFICIENT IN THE USE OF MATLAB TO SOLVE

SOPHISTICATED REAL-WORLD PROBLEMS WITHIN THE INTERDISCIPLINARY FIELD OF CHEMICAL ENGINEERING. THE TEXT FEATURES A SOLUTIONS MANUAL, LECTURE SLIDES, AND MATLAB PROGRAM FILES.

NUMERICAL, SYMBOLIC AND STATISTICAL COMPUTING FOR CHEMICAL ENGINEERS USING MATLAB - GHOSH, PALLAB 2018-09-01

NUMERICAL, ANALYTICAL AND STATISTICAL COMPUTATIONS ARE ROUTINE AFFAIRS FOR CHEMICAL ENGINEERS. THEY USUALLY PREFER A SINGLE SOFTWARE TO SOLVE THEIR COMPUTATIONAL PROBLEMS, AND AT PRESENT, MATLAB HAS EMERGED AS A POWERFUL COMPUTATIONAL LANGUAGE, WHICH IS PREFERABLY USED FOR THIS PURPOSE, DUE TO ITS BUILT-IN FUNCTIONS AND TOOLBOXES. CONSIDERING THE NEEDS AND CONVENIENCE OF THE STUDENTS, THE AUTHOR HAS MADE AN ATTEMPT TO WRITE THIS BOOK, WHICH EXPLAINS THE VARIOUS CONCEPTS OF MATLAB IN A SYSTEMATIC WAY AND MAKES ITS READERS PROFICIENT IN USING MATLAB FOR COMPUTING. IT MAINLY FOCUSES ON THE APPLICATIONS OF MATLAB, RATHER THAN ITS USE IN PROGRAMMING BASIC NUMERICAL ALGORITHMS. COMMENCING WITH THE INTRODUCTION TO MATLAB, THE TEXT COVERS VECTOR AND MATRIX COMPUTATIONS, SOLUTION OF LINEAR AND NON-LINEAR EQUATIONS, DIFFERENTIATION AND INTEGRATION, AND SOLUTION OF ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS. NEXT, ANALYTICAL COMPUTATIONS USING THE SYMBOLIC MATH TOOLBOX AND STATISTICAL COMPUTATIONS USING THE STATISTICS AND MACHINE LEARNING TOOLBOX ARE EXPLAINED. FINALLY, THE BOOK DESCRIBES VARIOUS CURVE FITTING TECHNIQUES USING THE CURVE FITTING TOOLBOX. INCLUSION OF ALL THESE ADVANCED-LEVEL TOPICS IN THE BOOK STANDS IT OUT FROM THE REST. KEY FEATURES

- NUMEROUS WORKED-OUT EXAMPLES TO ENABLE THE READERS UNDERSTAND THE STEPS INVOLVED IN SOLVING THE CHEMICAL ENGINEERING PROBLEMS
- MATLAB CODES TO EXPLAIN THE COMPUTATIONAL TECHNIQUES
- SEVERAL SNAPSHOTS TO HELP THE READERS UNDERSTAND THE STEP-BY-STEP PROCEDURES OF USING THE TOOLBOXES
- CHAPTER-END EXERCISES, INCLUDING SHORT-ANSWER QUESTIONS AND NUMERICAL PROBLEMS
- APPENDIX COMPRISING THE DEFINITIONS OF SOME IMPORTANT AND SPECIAL MATRICES
- SUPPLEMENTED WITH SOLUTIONS MANUAL CONTAINING COMPLETE DETAILED SOLUTIONS TO THE UNSOLVED ANALYTICAL PROBLEMS
- ACCESSIBILITY OF SELECTED COLOUR FIGURES (INCLUDING SCREENSHOTS AND RESULTS/OUTPUTS OF THE PROGRAMS) CITED IN THE TEXT AT WWW.PHINDIA.COM/PALLAB_GHOSH.

TARGET AUDIENCE

- BE/B.TECH (CHEMICAL ENGINEERING)
- ME/M.TECH (CHEMICAL ENGINEERING)

NUMERICAL METHODS FOR CHEMICAL ENGINEERS USING EXCEL, VBA, AND MATLAB - VICTOR J. LAW 2013-04-08

WHILE TEACHING THE NUMERICAL METHODS FOR ENGINEERS COURSE OVER THE LAST 15 YEARS, THE AUTHOR FOUND A NEED FOR A NEW TEXTBOOK, ONE THAT WAS LESS ELEMENTARY, PROVIDED APPLICATIONS AND PROBLEMS BETTER SUITED FOR CHEMICAL ENGINEERS, AND CONTAINED INSTRUCTION IN VISUAL BASIC® FOR APPLICATIONS (VBA). THIS LED TO SIX YEARS OF DEVELOPING TEACHING NOTES THAT HAVE BEEN ENHANCED TO CREATE THE CURRENT

TEXTBOOK, NUMERICAL METHODS FOR CHEMICAL ENGINEERS USING EXCEL®, VBA, AND MATLAB®. FOCUSING ON EXCEL GIVES THE ADVANTAGE OF IT BEING GENERALLY AVAILABLE, SINCE IT IS PRESENT ON EVERY COMPUTER—PC AND MAC—THAT HAS MICROSOFT OFFICE INSTALLED. THE VBA PROGRAMMING ENVIRONMENT COMES WITH EXCEL AND GREATLY ENHANCES THE CAPABILITIES OF EXCEL SPREADSHEETS. WHILE THERE IS NO PERFECT PROGRAMMING SYSTEM, TEACHING THIS COMBINATION OFFERS KNOWLEDGE IN A WIDELY AVAILABLE PROGRAM THAT IS COMMONLY USED (EXCEL) AS WELL AS A POPULAR ACADEMIC SOFTWARE PACKAGE (MATLAB). CHAPTERS COVER NONLINEAR EQUATIONS, VISUAL BASIC, LINEAR ALGEBRA, ORDINARY DIFFERENTIAL EQUATIONS, REGRESSION ANALYSIS, PARTIAL DIFFERENTIAL EQUATIONS, AND MATHEMATICAL PROGRAMMING METHODS. EACH CHAPTER CONTAINS EXAMPLES THAT SHOW IN DETAIL HOW A PARTICULAR NUMERICAL METHOD OR PROGRAMMING METHODOLOGY CAN BE IMPLEMENTED IN EXCEL AND/OR VBA (OR MATLAB IN CHAPTER 10). MOST OF THE EXAMPLES AND PROBLEMS PRESENTED IN THE TEXT ARE RELATED TO CHEMICAL AND BIOMOLECULAR ENGINEERING AND COVER A BROAD RANGE OF APPLICATION AREAS INCLUDING THERMODYNAMICS, FLUID FLOW, HEAT TRANSFER, MASS TRANSFER, REACTION KINETICS, REACTOR DESIGN, PROCESS DESIGN, AND PROCESS CONTROL. THE CHAPTERS FEATURE “DID YOU KNOW” BOXES, USED TO REMIND READERS OF EXCEL FEATURES. THEY ALSO CONTAIN END-OF-CHAPTER EXERCISES, WITH SOLUTIONS PROVIDED.

MATLAB WITH APPLICATIONS TO ENGINEERING, PHYSICS AND FINANCE - DAVID BAEZ-LOPEZ 2009-10-28

MASTER THE TOOLS OF MATLAB THROUGH HANDS-ON EXAMPLES SHOWS HOW TO SOLVE MATH PROBLEMS USING MATLAB THE MATHEMATICAL SOFTWARE MATLAB® INTEGRATES COMPUTATION, VISUALIZATION, AND PROGRAMMING TO PRODUCE A POWERFUL TOOL FOR A NUMBER OF DIFFERENT TASKS IN MATHEMATICS. FOCUSING ON THE MATLAB TOOLBOXES ESPECIALLY DEDICATED TO SCIENCE, FINANCE, AND ENGINEERING, MATLAB® WITH APPLICATIONS TO ENGINEERING, PHYSICS AND FINANCE EXPLAINS HOW TO PERFORM COMPLEX MATHEMATICAL TASKS WITH RELATIVELY SIMPLE PROGRAMS. THIS VERSATILE BOOK IS ACCESSIBLE ENOUGH FOR NOVICES AND USERS WITH ONLY A FUNDAMENTAL KNOWLEDGE OF MATLAB, YET COVERS MANY SOPHISTICATED CONCEPTS TO MAKE IT HELPFUL FOR EXPERIENCED USERS AS WELL. THE AUTHOR FIRST INTRODUCES THE BASICS OF MATLAB, DESCRIBING SIMPLE FUNCTIONS SUCH AS DIFFERENTIATION, INTEGRATION, AND PLOTTING. HE THEN ADDRESSES ADVANCED TOPICS, INCLUDING PROGRAMMING, PRODUCING EXECUTABLES, PUBLISHING RESULTS DIRECTLY FROM MATLAB PROGRAMS, AND CREATING GRAPHICAL USER INTERFACES. THE TEXT ALSO PRESENTS EXAMPLES OF SIMULINK® THAT HIGHLIGHT THE ADVANTAGES OF USING THIS SOFTWARE PACKAGE FOR SYSTEM MODELING AND SIMULATION. THE APPLICATIONS-DEDICATED CHAPTERS AT THE END OF THE BOOK EXPLORE THE USE OF MATLAB IN DIGITAL SIGNAL PROCESSING, CHEMICAL AND FOOD ENGINEERING, ASTRONOMY, OPTICS, FINANCIAL DERIVATIVES, AND MUCH MORE.

FEEDBACK CONTROL SYSTEMS - FARZIN ASADI

2019-04-16

FEEDBACK CONTROL SYSTEMS IS AN IMPORTANT COURSE IN AEROSPACE ENGINEERING, CHEMICAL ENGINEERING, ELECTRICAL ENGINEERING, MECHANICAL ENGINEERING, AND MECHATRONICS ENGINEERING, TO NAME JUST A FEW. FEEDBACK CONTROL SYSTEMS IMPROVE THE SYSTEM'S BEHAVIOR SO THE DESIRED RESPONSE CAN BE ACHIEVED. THE FIRST COURSE ON CONTROL ENGINEERING DEALS WITH CONTINUOUS TIME (CT) LINEAR TIME INVARIANT (LTI) SYSTEMS. PLENTY OF GOOD TEXTBOOKS ON THE SUBJECT ARE AVAILABLE ON THE MARKET, SO THERE IS NO NEED TO ADD ONE MORE. THIS BOOK DOES NOT FOCUS ON THE CONTROL ENGINEERING THEORIES AS IT IS ASSUMED THAT THE READER IS FAMILIAR WITH THEM, I.E., TOOK/TAKES A COURSE ON CONTROL ENGINEERING, AND NOW WANTS TO LEARN THE APPLICATIONS OF MATLAB® IN CONTROL ENGINEERING. THE FOCUS OF THIS BOOK IS CONTROL ENGINEERING APPLICATIONS OF MATLAB® FOR A FIRST COURSE ON CONTROL ENGINEERING.

COMPUTATIONAL TECHNIQUES FOR PROCESS SIMULATION AND ANALYSIS USING MATLAB® - NIKET S. KAISARE
2017-09-18

MATLAB® HAS BECOME ONE OF THE PROMINENT LANGUAGES USED IN RESEARCH AND INDUSTRY AND OFTEN DESCRIBED AS "THE LANGUAGE OF TECHNICAL COMPUTING". THE FOCUS OF THIS BOOK WILL BE TO HIGHLIGHT THE USE OF MATLAB® IN TECHNICAL COMPUTING; OR MORE SPECIFICALLY, IN SOLVING PROBLEMS IN PROCESS SIMULATIONS. THIS BOOK AIMS TO BRING A PRACTICAL APPROACH TO EXPOUNDING THEORIES: BOTH NUMERICAL ASPECTS OF STABILITY AND CONVERGENCE, AS WELL AS LINEAR AND NONLINEAR ANALYSIS OF SYSTEMS. THE BOOK IS DIVIDED INTO THREE PARTS WHICH ARE LAID OUT WITH A "PROCESS ANALYSIS" VIEWPOINT. FIRST PART COVERS SYSTEM DYNAMICS FOLLOWED BY SOLUTION OF LINEAR AND NONLINEAR EQUATIONS, INCLUDING DIFFERENTIAL ALGEBRAIC EQUATIONS (DAE) WHILE THE LAST PART COVERS FUNCTION APPROXIMATION AND OPTIMIZATION. INTENDED TO BE AN ADVANCED LEVEL TEXTBOOK FOR NUMERICAL METHODS, SIMULATION AND ANALYSIS OF PROCESS SYSTEMS AND COMPUTATIONAL PROGRAMMING LAB, IT COVERS FOLLOWING KEY POINTS • COMPREHENSIVE COVERAGE OF NUMERICAL ANALYSES BASED ON MATLAB FOR CHEMICAL PROCESS EXAMPLES. • INCLUDES ANALYSIS OF TRANSIENT BEHAVIOR OF CHEMICAL PROCESSES. • DISCUSSES CODING HYGIENE, PROCESS ANIMATION AND GUI EXCLUSIVELY. • TREATMENT OF PROCESS DYNAMICS, LINEAR STABILITY, NONLINEAR ANALYSIS AND FUNCTION APPROXIMATION THROUGH CONTEMPORARY EXAMPLES. • FOCUS ON SIMULATION USING MATLAB TO SOLVE ODES AND PDES THAT ARE FREQUENTLY ENCOUNTERED IN PROCESS SYSTEMS.

MODELING AND SIMULATION OF CHEMICAL PROCESS SYSTEMS - NAYEF GHASEM 2018-11-08

IN THIS TEXTBOOK, THE AUTHOR TEACHES READERS HOW TO MODEL AND SIMULATE A UNIT PROCESS OPERATION THROUGH DEVELOPING MATHEMATICAL MODEL EQUATIONS, SOLVING MODEL EQUATIONS MANUALLY, AND COMPARING RESULTS WITH THOSE SIMULATED THROUGH SOFTWARE. IT COVERS

BOTH LUMPED PARAMETER SYSTEMS AND DISTRIBUTED PARAMETER SYSTEMS, AS WELL AS USING MATLAB AND SIMULINK TO SOLVE THE SYSTEM MODEL EQUATIONS FOR BOTH. SIMPLIFIED PARTIAL DIFFERENTIAL EQUATIONS ARE SOLVED USING COMSOL, AN EFFECTIVE TOOL TO SOLVE PDE, USING THE FINE ELEMENT METHOD. THIS BOOK INCLUDES END OF CHAPTER PROBLEMS AND WORKED EXAMPLES, AND SUMMARIZES READER GOALS AT THE BEGINNING OF EACH CHAPTER.

APPLIED MATHEMATICAL METHODS FOR CHEMICAL ENGINEERS - NORMAN W. LONEY 2016-03-09

FOCUSING ON THE APPLICATION OF MATHEMATICS TO CHEMICAL ENGINEERING, APPLIED MATHEMATICAL METHODS FOR CHEMICAL ENGINEERS ADDRESSES THE SETUP AND VERIFICATION OF MATHEMATICAL MODELS USING EXPERIMENTAL OR OTHER INDEPENDENTLY DERIVED DATA. THE BOOK PROVIDES AN INTRODUCTION TO DIFFERENTIAL EQUATIONS COMMON TO CHEMICAL ENGINEERING, FOLLOWED BY EXAMPLES OF FIRST-ORDER AND LINEAR SECOND-ORDER ORDINARY DIFFERENTIAL EQUATIONS. LATER CHAPTERS EXAMINE STURM-LIOUVILLE PROBLEMS, FOURIER SERIES, INTEGRALS, LINEAR PARTIAL DIFFERENTIAL EQUATIONS, REGULAR PERTURBATION, COMBINATION OF VARIABLES, AND NUMERICAL METHODS EMPHASIZING THE METHOD OF LINES WITH MATLAB® PROGRAMMING EXAMPLES. FULLY REVISED AND UPDATED, THIS THIRD EDITION: INCLUDES ADDITIONAL EXAMPLES RELATED TO PROCESS CONTROL, BESSEL FUNCTIONS, AND CONTEMPORARY AREAS SUCH AS DRUG DELIVERY INTRODUCES EXAMPLES OF VARIABLE COEFFICIENT STURM-LIOUVILLE PROBLEMS BOTH IN THE REGULAR AND SINGULAR TYPES DEMONSTRATES THE USE OF EULER AND MODIFIED EULER METHODS ALONGSIDE THE RUNGE-KUTTA ORDER-FOUR METHOD INSERTS MORE DEPTH ON SPECIFIC APPLICATIONS SUCH AS NONHOMOGENEOUS CASES OF SEPARATION OF VARIABLES ADDS A SECTION ON SPECIAL TYPES OF MATRICES SUCH AS UPPER- AND LOWER-TRIANGULAR MATRICES PRESENTS A JUSTIFICATION FOR FOURIER-BESSEL SERIES IN PREFERENCE TO A COMPLICATED PROOF INCORPORATES EXAMPLES RELATED TO BIOMEDICAL ENGINEERING APPLICATIONS ILLUSTRATES THE USE OF THE PREDICTOR-CORRECTOR METHOD EXPANDS THE PROBLEM SETS OF NUMEROUS CHAPTERS APPLIED MATHEMATICAL METHODS FOR CHEMICAL ENGINEERS, THIRD EDITION USES WORKED EXAMPLES TO EXPOSE READER TO THE MATHEMATICAL METHODS THAT ARE ESSENTIAL TO SOLVING REAL-WORLD PROCESS ENGINEERING PROBLEMS.

- RICCARDO

TESSER 2020-12-07

OFFERS THE READER A MODERN APPROACH TO REACTOR DESCRIPTION AND MODELLING. USING THE WIDELY APPLIED NUMERICAL LANGUAGE MATLAB, IT PROVIDES THE READER WITH CATEGORIZED GROUPS OF GENERAL CODE FOR A WIDE VARIETY OF CHEMICAL REACTORS. BEING DESIGNED AS A TOOL FOR RESEARCHERS AND PROFESSIONALS, THE CODE CAN EASILY BE EXTENDED AND ADAPTED BY THE READER TO THEIR OWN SPECIFIC PROBLEMS.