

# PORTLAND STATE UNIVERSITY MECHANICAL ENGINEERING

**PORTLAND STATE UNIVERSITY MECHANICAL ENGINEERING** IS A DISTINGUISHED PROGRAM DESIGNED TO EQUIP STUDENTS WITH COMPREHENSIVE KNOWLEDGE AND PRACTICAL SKILLS ESSENTIAL FOR A SUCCESSFUL CAREER IN THE FIELD OF MECHANICAL ENGINEERING. THIS PROGRAM EMPHASIZES A STRONG FOUNDATION IN ENGINEERING PRINCIPLES, COMBINED WITH HANDS-ON EXPERIENCE AND RESEARCH OPPORTUNITIES. STUDENTS BENEFIT FROM STATE-OF-THE-ART FACILITIES, DEDICATED FACULTY, AND A CURRICULUM THAT INTEGRATES EMERGING TECHNOLOGIES AND SUSTAINABILITY PRACTICES. PORTLAND STATE UNIVERSITY MECHANICAL ENGINEERING FOSTERS INNOVATION AND PREPARES GRADUATES TO ADDRESS COMPLEX ENGINEERING CHALLENGES IN INDUSTRIES SUCH AS MANUFACTURING, ENERGY, ROBOTICS, AND AEROSPACE. THIS ARTICLE EXPLORES THE PROGRAM'S ACADEMIC OFFERINGS, RESEARCH INITIATIVES, FACILITIES, CAREER PROSPECTS, AND STUDENT SUPPORT SERVICES. THE FOLLOWING SECTIONS PROVIDE A DETAILED OVERVIEW TO HELP PROSPECTIVE STUDENTS AND INTERESTED PARTIES UNDERSTAND THE UNIQUE ATTRIBUTES OF PORTLAND STATE UNIVERSITY'S MECHANICAL ENGINEERING DEPARTMENT.

- ACADEMIC PROGRAMS AND CURRICULUM
- RESEARCH AND INNOVATION
- FACILITIES AND RESOURCES
- CAREER OPPORTUNITIES AND INDUSTRY CONNECTIONS
- STUDENT SUPPORT AND EXTRACURRICULAR ACTIVITIES

## ACADEMIC PROGRAMS AND CURRICULUM

THE PORTLAND STATE UNIVERSITY MECHANICAL ENGINEERING PROGRAM OFFERS A COMPREHENSIVE SUITE OF ACADEMIC PROGRAMS DESIGNED TO CATER TO UNDERGRADUATE AND GRADUATE STUDENTS. THE CURRICULUM IS CAREFULLY STRUCTURED TO PROVIDE A BALANCE BETWEEN THEORETICAL KNOWLEDGE AND PRACTICAL APPLICATION, ENSURING STUDENTS DEVELOP CRITICAL THINKING, PROBLEM-SOLVING, AND TECHNICAL SKILLS.

## BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

THE UNDERGRADUATE PROGRAM FOCUSES ON CORE MECHANICAL ENGINEERING SUBJECTS SUCH AS THERMODYNAMICS, FLUID MECHANICS, MATERIALS SCIENCE, DYNAMICS, AND CONTROL SYSTEMS. STUDENTS ENGAGE IN LABORATORY WORK AND DESIGN PROJECTS THAT ENCOURAGE HANDS-ON LEARNING AND TEAMWORK. THE CURRICULUM ALSO INTEGRATES COURSES IN MATHEMATICS, PHYSICS, AND COMPUTER PROGRAMMING TO SUPPORT ADVANCED ENGINEERING CONCEPTS.

## GRADUATE PROGRAMS

GRADUATE STUDENTS CAN PURSUE MASTER'S AND PH.D. DEGREES WITH OPTIONS TO SPECIALIZE IN AREAS LIKE RENEWABLE ENERGY, ROBOTICS, MANUFACTURING, AND BIOMECHANICS. GRADUATE COURSEWORK IS COMPLEMENTED BY RESEARCH PROJECTS THAT ENABLE STUDENTS TO CONTRIBUTE TO ADVANCEMENTS IN MECHANICAL ENGINEERING. PORTLAND STATE UNIVERSITY MECHANICAL ENGINEERING GRADUATE PROGRAMS EMPHASIZE INTERDISCIPLINARY COLLABORATION AND INNOVATION.

## CURRICULUM HIGHLIGHTS

- CORE COURSES IN MECHANICS, THERMODYNAMICS, AND MATERIALS SCIENCE

- ELECTIVES IN ADVANCED TOPICS SUCH AS ROBOTICS, ENERGY SYSTEMS, AND COMPUTATIONAL METHODS
- CAPSTONE DESIGN PROJECTS PROMOTING REAL-WORLD PROBLEM SOLVING
- OPPORTUNITIES FOR INTERNSHIPS AND COOPERATIVE EDUCATION

## RESEARCH AND INNOVATION

RESEARCH IS A CORNERSTONE OF THE PORTLAND STATE UNIVERSITY MECHANICAL ENGINEERING DEPARTMENT, FOSTERING AN ENVIRONMENT WHERE STUDENTS AND FACULTY COLLABORATE ON CUTTING-EDGE PROJECTS. THE PROGRAM ENCOURAGES INNOVATIVE APPROACHES TO SOLVING ENGINEERING CHALLENGES RELATED TO SUSTAINABILITY, ENERGY EFFICIENCY, AND EMERGING TECHNOLOGIES.

## KEY RESEARCH AREAS

RESEARCH AT PORTLAND STATE UNIVERSITY MECHANICAL ENGINEERING SPANS SEVERAL VITAL AREAS, INCLUDING:

- RENEWABLE AND SUSTAINABLE ENERGY SYSTEMS
- ADVANCED MANUFACTURING AND MATERIALS DEVELOPMENT
- ROBOTICS AND AUTOMATION TECHNOLOGIES
- BIOMECHANICAL ENGINEERING AND HUMAN FACTORS
- COMPUTATIONAL MODELING AND SIMULATION

## RESEARCH CENTERS AND COLLABORATIONS

THE DEPARTMENT IS AFFILIATED WITH VARIOUS RESEARCH CENTERS AND COLLABORATES WITH LOCAL INDUSTRIES AND GOVERNMENT AGENCIES. THESE PARTNERSHIPS PROVIDE STUDENTS WITH OPPORTUNITIES TO PARTICIPATE IN FUNDED RESEARCH PROJECTS, INTERNSHIPS, AND TECHNOLOGY TRANSFER INITIATIVES. SUCH ENGAGEMENT ENHANCES THE PRACTICAL RELEVANCE OF THEIR ACADEMIC EXPERIENCE.

## FACILITIES AND RESOURCES

PORTLAND STATE UNIVERSITY MECHANICAL ENGINEERING STUDENTS HAVE ACCESS TO MODERN FACILITIES EQUIPPED WITH THE LATEST TECHNOLOGIES TO SUPPORT BOTH LEARNING AND RESEARCH ACTIVITIES. THE DEPARTMENT PRIORITIZES PROVIDING AN ENVIRONMENT CONDUCIVE TO INNOVATION AND SKILL DEVELOPMENT.

## LABORATORIES AND WORKSHOPS

THE PROGRAM FEATURES SPECIALIZED LABORATORIES INCLUDING:

- THERMODYNAMICS AND HEAT TRANSFER LABS
- FLUID MECHANICS AND HYDRAULICS FACILITIES

- MATERIALS TESTING AND CHARACTERIZATION LABS
- ROBOTICS AND AUTOMATION WORKSHOPS
- COMPUTER-AIDED DESIGN (CAD) AND MANUFACTURING LABS

## TECHNOLOGY AND SOFTWARE

STUDENTS UTILIZE ADVANCED ENGINEERING SOFTWARE FOR SIMULATION, DESIGN, AND ANALYSIS, INCLUDING CAD TOOLS, FINITE ELEMENT ANALYSIS (FEA), AND COMPUTATIONAL FLUID DYNAMICS (CFD) PROGRAMS. ACCESS TO HIGH-PERFORMANCE COMPUTING RESOURCES SUPPORTS COMPLEX MODELING AND RESEARCH PROJECTS.

## CAREER OPPORTUNITIES AND INDUSTRY CONNECTIONS

GRADUATES OF PORTLAND STATE UNIVERSITY MECHANICAL ENGINEERING BENEFIT FROM STRONG CONNECTIONS TO INDUSTRY, WHICH ENHANCE EMPLOYMENT PROSPECTS AND PROFESSIONAL DEVELOPMENT. THE PROGRAM MAINTAINS RELATIONSHIPS WITH COMPANIES ACROSS MULTIPLE SECTORS TO FACILITATE INTERNSHIPS, CO-OP PLACEMENTS, AND JOB OPPORTUNITIES.

## EMPLOYMENT SECTORS

MECHANICAL ENGINEERING GRADUATES FIND OPPORTUNITIES IN A VARIETY OF INDUSTRIES SUCH AS:

- AUTOMOTIVE AND AEROSPACE ENGINEERING
- ENERGY AND UTILITIES
- MANUFACTURING AND PRODUCTION
- ROBOTICS AND AUTOMATION
- BIOMEDICAL AND HEALTHCARE TECHNOLOGY

## CAREER SERVICES AND NETWORKING

THE UNIVERSITY PROVIDES CAREER COUNSELING, RESUME WORKSHOPS, AND NETWORKING EVENTS TAILORED TO ENGINEERING STUDENTS. INDUSTRY ADVISORY BOARDS HELP ALIGN THE CURRICULUM WITH CURRENT MARKET DEMANDS, ENSURING GRADUATES ARE WELL-PREPARED FOR THE WORKFORCE.

## STUDENT SUPPORT AND EXTRACURRICULAR ACTIVITIES

PORTLAND STATE UNIVERSITY MECHANICAL ENGINEERING STUDENTS RECEIVE COMPREHENSIVE SUPPORT THROUGH ACADEMIC ADVISING, TUTORING, AND MENTORING PROGRAMS. THE DEPARTMENT FOSTERS A COLLABORATIVE COMMUNITY THAT ENCOURAGES STUDENT INVOLVEMENT BEYOND THE CLASSROOM.

## CLUBS AND ORGANIZATIONS

SEVERAL STUDENT ORGANIZATIONS ENHANCE THE EDUCATIONAL EXPERIENCE BY OFFERING OPPORTUNITIES FOR LEADERSHIP, TEAMWORK, AND PROFESSIONAL GROWTH. THESE INCLUDE:

- AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) STUDENT CHAPTER
- ROBOTICS AND DESIGN CLUBS
- ENGINEERING HONOR SOCIETIES
- COMMUNITY OUTREACH AND STEM PROMOTION GROUPS

## WORKSHOPS AND SEMINARS

REGULAR WORKSHOPS AND GUEST LECTURES EXPOSE STUDENTS TO EMERGING TRENDS AND CAREER PATHWAYS IN MECHANICAL ENGINEERING. THESE EVENTS PROVIDE VALUABLE INSIGHTS AND NETWORKING OPPORTUNITIES WITH INDUSTRY PROFESSIONALS AND ALUMNI.

## FREQUENTLY ASKED QUESTIONS

### WHAT MECHANICAL ENGINEERING PROGRAMS ARE OFFERED AT PORTLAND STATE UNIVERSITY?

PORTLAND STATE UNIVERSITY OFFERS A BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING, AS WELL AS GRADUATE PROGRAMS INCLUDING MASTER'S AND PH.D. DEGREES IN MECHANICAL ENGINEERING.

### IS PORTLAND STATE UNIVERSITY'S MECHANICAL ENGINEERING PROGRAM ABET ACCREDITED?

YES, THE MECHANICAL ENGINEERING PROGRAM AT PORTLAND STATE UNIVERSITY IS ACCREDITED BY ABET, ENSURING IT MEETS HIGH EDUCATIONAL STANDARDS.

### WHAT RESEARCH OPPORTUNITIES ARE AVAILABLE FOR MECHANICAL ENGINEERING STUDENTS AT PORTLAND STATE UNIVERSITY?

MECHANICAL ENGINEERING STUDENTS AT PORTLAND STATE UNIVERSITY CAN ENGAGE IN RESEARCH AREAS SUCH AS ROBOTICS, RENEWABLE ENERGY, MATERIALS SCIENCE, AND MANUFACTURING THROUGH FACULTY-LED PROJECTS AND RESEARCH CENTERS.

### DOES PORTLAND STATE UNIVERSITY OFFER INTERNSHIPS OR CO-OP PROGRAMS FOR MECHANICAL ENGINEERING STUDENTS?

YES, PORTLAND STATE UNIVERSITY HAS PARTNERSHIPS WITH LOCAL INDUSTRIES OFFERING INTERNSHIPS AND COOPERATIVE EDUCATION PROGRAMS TO PROVIDE MECHANICAL ENGINEERING STUDENTS WITH PRACTICAL WORK EXPERIENCE.

### WHAT FACILITIES AND LABS SUPPORT MECHANICAL ENGINEERING STUDENTS AT

## PORTLAND STATE UNIVERSITY?

PORTLAND STATE UNIVERSITY PROVIDES STATE-OF-THE-ART FACILITIES INCLUDING MACHINE SHOPS, THERMAL-FLUID LABS, ROBOTICS LABS, AND COMPUTER-AIDED DESIGN (CAD) LABS TO SUPPORT HANDS-ON LEARNING FOR MECHANICAL ENGINEERING STUDENTS.

## HOW COMPETITIVE IS ADMISSION TO THE MECHANICAL ENGINEERING PROGRAM AT PORTLAND STATE UNIVERSITY?

ADMISSION TO PORTLAND STATE UNIVERSITY'S MECHANICAL ENGINEERING PROGRAM IS MODERATELY COMPETITIVE, WITH CONSIDERATION GIVEN TO ACADEMIC PERFORMANCE, PREREQUISITE COURSEWORK, AND RELEVANT EXPERIENCE.

## ARE THERE STUDENT ORGANIZATIONS RELATED TO MECHANICAL ENGINEERING AT PORTLAND STATE UNIVERSITY?

YES, STUDENTS CAN JOIN ORGANIZATIONS SUCH AS THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) STUDENT CHAPTER AND OTHER ENGINEERING CLUBS THAT OFFER NETWORKING AND PROFESSIONAL DEVELOPMENT OPPORTUNITIES.

## WHAT CAREER SERVICES DOES PORTLAND STATE UNIVERSITY PROVIDE FOR MECHANICAL ENGINEERING STUDENTS?

PORTLAND STATE UNIVERSITY OFFERS CAREER COUNSELING, JOB FAIRS, RESUME WORKSHOPS, AND EMPLOYER NETWORKING EVENTS SPECIFICALLY GEARED TOWARD ENGINEERING STUDENTS TO HELP THEM SECURE EMPLOYMENT AFTER GRADUATION.

## CAN MECHANICAL ENGINEERING STUDENTS AT PORTLAND STATE UNIVERSITY PARTICIPATE IN CAPSTONE DESIGN PROJECTS?

YES, MECHANICAL ENGINEERING STUDENTS AT PORTLAND STATE UNIVERSITY PARTICIPATE IN SENIOR CAPSTONE DESIGN PROJECTS THAT INVOLVE SOLVING REAL-WORLD ENGINEERING PROBLEMS, OFTEN IN COLLABORATION WITH INDUSTRY PARTNERS.

## ADDITIONAL RESOURCES

- 1. INTRODUCTION TO MECHANICAL ENGINEERING: CONCEPTS AND APPLICATIONS AT PORTLAND STATE UNIVERSITY*  
THIS BOOK PROVIDES A COMPREHENSIVE OVERVIEW OF MECHANICAL ENGINEERING PRINCIPLES WITH A FOCUS ON THE CURRICULUM AND RESEARCH EMPHASIS AT PORTLAND STATE UNIVERSITY. IT COVERS FUNDAMENTAL TOPICS SUCH AS THERMODYNAMICS, FLUID MECHANICS, AND MATERIALS SCIENCE, INTEGRATING REAL-WORLD APPLICATIONS AND CASE STUDIES FROM PSU PROJECTS. THE TEXT IS IDEAL FOR UNDERGRADUATES SEEKING A STRONG FOUNDATION ALIGNED WITH THE UNIVERSITY'S ACADEMIC STANDARDS.
- 2. ADVANCED THERMODYNAMICS FOR MECHANICAL ENGINEERS: INSIGHTS FROM PORTLAND STATE UNIVERSITY RESEARCH*  
FOCUSING ON ADVANCED THERMODYNAMICS, THIS BOOK DELVES INTO THE LATEST RESEARCH CONDUCTED BY PSU'S MECHANICAL ENGINEERING FACULTY. IT EXPLORES ENERGY SYSTEMS, HEAT TRANSFER, AND ENVIRONMENTAL CONSIDERATIONS WITH PRACTICAL EXAMPLES FROM ONGOING PSU PROJECTS. GRADUATE STUDENTS AND RESEARCHERS WILL FIND DETAILED ANALYSES AND PROBLEM-SOLVING TECHNIQUES ESSENTIAL FOR INNOVATION IN ENERGY ENGINEERING.
- 3. FLUID MECHANICS AND DYNAMICS: PSU MECHANICAL ENGINEERING PERSPECTIVES*  
THIS TITLE COVERS THE PRINCIPLES OF FLUID MECHANICS AS TAUGHT AT PORTLAND STATE UNIVERSITY, EMPHASIZING BOTH THEORETICAL AND COMPUTATIONAL APPROACHES. THE BOOK INCLUDES EXPERIMENTS AND SIMULATIONS FROM PSU LABS, HELPING STUDENTS VISUALIZE COMPLEX FLOW PHENOMENA. IT IS A VALUABLE RESOURCE FOR THOSE INTERESTED IN AEROSPACE, AUTOMOTIVE, AND ENVIRONMENTAL FLUID DYNAMICS.
- 4. MATERIALS SCIENCE AND ENGINEERING IN THE PSU MECHANICAL ENGINEERING DEPARTMENT*  
HIGHLIGHTING THE ROLE OF MATERIALS SCIENCE IN MECHANICAL ENGINEERING, THIS BOOK PRESENTS THE LATEST ADVANCEMENTS AND TEACHING METHODS USED AT PORTLAND STATE UNIVERSITY. TOPICS INCLUDE MATERIAL PROPERTIES, SELECTION, AND

TESTING, WITH CASE STUDIES ON INNOVATIVE MATERIALS DEVELOPED BY PSU RESEARCHERS. THE BOOK SERVES AS A BRIDGE BETWEEN FOUNDATIONAL KNOWLEDGE AND CUTTING-EDGE APPLICATIONS.

*5. MECHANICAL DESIGN AND MANUFACTURING: PORTLAND STATE UNIVERSITY APPROACHES*

THIS BOOK EXPLORES MECHANICAL DESIGN PRINCIPLES AND MANUFACTURING PROCESSES WITH INSIGHTS FROM PSU'S ENGINEERING WORKSHOPS AND INDUSTRY PARTNERSHIPS. IT DISCUSSES CAD MODELING, PROTOTYPING, AND SUSTAINABLE MANUFACTURING PRACTICES INCORPORATED INTO THE PSU CURRICULUM. STUDENTS AND PROFESSIONALS WILL BENEFIT FROM THE PRACTICAL EXAMPLES AND PROJECT-BASED LEARNING METHODOLOGIES.

*6. ROBOTICS AND AUTOMATION IN MECHANICAL ENGINEERING AT PORTLAND STATE UNIVERSITY*

DETAILING THE INTEGRATION OF ROBOTICS AND AUTOMATION WITHIN PSU'S MECHANICAL ENGINEERING PROGRAM, THIS BOOK COVERS CONTROL SYSTEMS, SENSORS, AND ROBOTIC DESIGN. IT HIGHLIGHTS STUDENT PROJECTS AND FACULTY RESEARCH FOCUSED ON AUTOMATION TECHNOLOGIES APPLICABLE TO MANUFACTURING, HEALTHCARE, AND SERVICE INDUSTRIES. THE TEXT IS SUITABLE FOR THOSE INTERESTED IN THE FUTURE OF MECHANICAL ENGINEERING INNOVATION.

*7. ENERGY SYSTEMS ENGINEERING: PORTLAND STATE UNIVERSITY'S APPROACH TO SUSTAINABLE SOLUTIONS*

THIS TITLE EXAMINES ENERGY CONVERSION, RENEWABLE ENERGY TECHNOLOGIES, AND SUSTAINABILITY INITIATIVES LED BY PSU MECHANICAL ENGINEERS. IT PROVIDES A THOROUGH UNDERSTANDING OF ENERGY EFFICIENCY, SYSTEM MODELING, AND POLICY IMPLICATIONS. THE BOOK IS A RESOURCE FOR STUDENTS AND PRACTITIONERS AIMING TO ADDRESS GLOBAL ENERGY CHALLENGES THROUGH ENGINEERING EXPERTISE.

*8. COMPUTATIONAL METHODS IN MECHANICAL ENGINEERING: PSU TECHNIQUES AND TOOLS*

FOCUSING ON NUMERICAL ANALYSIS AND SIMULATION, THIS BOOK PRESENTS COMPUTATIONAL METHODS TAUGHT AT PORTLAND STATE UNIVERSITY FOR SOLVING COMPLEX MECHANICAL ENGINEERING PROBLEMS. IT COVERS FINITE ELEMENT ANALYSIS, COMPUTATIONAL FLUID DYNAMICS, AND OPTIMIZATION TECHNIQUES WITH EXAMPLES FROM PSU RESEARCH PROJECTS. THE BOOK IS ESSENTIAL FOR STUDENTS SEEKING TO ENHANCE THEIR COMPUTATIONAL SKILLS IN ENGINEERING.

*9. BIOMECHANICS AND MECHANICAL ENGINEERING AT PORTLAND STATE UNIVERSITY*

THIS INTERDISCIPLINARY BOOK EXPLORES THE APPLICATION OF MECHANICAL ENGINEERING PRINCIPLES TO BIOLOGICAL SYSTEMS, REFLECTING PSU'S RESEARCH IN BIOMECHANICS. TOPICS INCLUDE PROSTHETICS DESIGN, HUMAN MOVEMENT ANALYSIS, AND TISSUE ENGINEERING. IT SERVES AS A GUIDE FOR STUDENTS AND RESEARCHERS INTERESTED IN THE CONVERGENCE OF ENGINEERING AND LIFE SCIENCES.

## **[Portland State University Mechanical Engineering](#)**

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**portland state university mechanical engineering: Mechanical Engineering , 1911**  
**portland state university mechanical engineering: Fundamentals of Orbital Inflammatory Disorders** Hadi Khazaei, 2025-05-23 Diseases affecting the orbit and oculo-facial region present with a diverse range of clinical manifestations. Space-occupying lesions within the orbit can arise from infections, inflammations, vascular malformations, or malignancies. This variability in presentation is largely attributed to the complex anatomy of the orbit and the diverse nature of the disease processes that often appear as orbital inflammatory disorders. This book provides an in-depth exploration of orbital inflammatory disorders, focusing on their diagnosis and management. It includes chapters on cutting-edge topics such as tear proteomics, orbital and facial ultrasonography, AI-assisted point-of-care ultrasonography, imaging bioinformatics, and precision medicine.

**portland state university mechanical engineering:** *South/North Corridor Project, Improvements to the Existing Urban Transportation*, 1999

**portland state university mechanical engineering: DHM and Posturography** Sofia Scataglini, Gunther Paul, 2019-08-22 DHM and Posturography explores the body of knowledge and state-of-the-art in digital human modeling, along with its application in ergonomics and posturography. The book provides an industry first introductory and practitioner focused overview of human simulation tools, with detailed chapters describing elements of posture, postural interactions, and fields of application. Thus, DHM tools and a specific scientific/practical problem - the study of posture - are linked in a coherent framework. In addition, sections show how DHM interfaces with the most common physical devices for posture analysis. Case studies provide the applied knowledge necessary for practitioners to make informed decisions. Digital Human Modelling is the science of representing humans with their physical properties, characteristics and behaviors in computerized, virtual models. These models can be used standalone, or integrated with other computerized object design systems, to design or study designs, workplaces or products in their relationship with humans. - Presents an introductory, up-to-date overview and introduction to all industrially relevant DHM systems that will enable users on trialing, procurement decisions and initial applications - Includes user-level examples and case studies of DHM application in various industrial fields - Provides a structured and posturography focused compendium that is easy to access, read and understand

**portland state university mechanical engineering: Big Data and Information Theory** Jiuping Xu, Syed Ejaz Ahmed, Zongmin Li, 2022-06-01 Big Data and Information Theory are a binding force between various areas of knowledge that allow for societal advancement. Rapid development of data analytic and information theory allows companies to store vast amounts of information about production, inventory, service, and consumer activities. More powerful CPUs and cloud computing make it possible to do complex optimization instead of using heuristic algorithms, as well as instant rather than offline decision-making. The era of big data challenges includes analysis, capture, curation, search, sharing, storage, transfer, visualization, and privacy violations. Big data calls for better integration of optimization, statistics, and data mining. In response to these challenges this book brings together leading researchers and engineers to exchange and share their experiences and research results about big data and information theory applications in various areas. This book covers a broad range of topics including statistics, data mining, data warehouse implementation, engineering management in large-scale infrastructure systems, data-driven sustainable supply chain network, information technology service offshoring project issues, online rumors governance, preliminary cost estimation, and information system project selection. The chapters in this book were originally published in the journal, International Journal of Management Science and Engineering Management.

**portland state university mechanical engineering: Magnesium and Its Alloys** Leszek A. Dobrzanski, Menachem Bamberger, George E. Totten, 2019-08-01 Magnesium and Its Alloys: Technology and Applications covers a wide scope of topics related to magnesium science and engineering, from manufacturing and production to finishing and applications. This handbook contains thirteen chapters, each contributed by experts in their respective fields, and presents a broad spectrum of new information on pure magnesium, magnesium alloys, and magnesium matrix MgMCs composites. It covers such topics as computational thermodynamics, modern Mg-alloys with enhanced creep or fatigue properties, cutting-edge approaches to melt treating (grain refinement, micro-alloying, and the resulting solidification and growth), coatings, surface engineering, environmental protection (recycling and green energy storage and production), as well as biomedical applications. Aimed at researchers, professionals, and graduate students, the book conveys comprehensive and cutting-edge knowledge on magnesium alloys. It is especially useful to those in the fields of materials engineering, mechanical engineering, manufacturing engineering, and metallurgy.

**portland state university mechanical engineering:** *Social Sustainability* Veronica Dujon,

Jesse Dillard, Eileen M. Brennan, 2013-08-21 How can we raise the standard of living of the world's poor and maintain high levels of social health and well-being in the developed world, while simultaneously reducing the environmental damage wrought by human activity? The social dimension of sustainability is becoming recognized as a necessary if not sufficient condition for attaining economic and environmental sustainability. The requisite dialogue requires inclusion at multi-levels. This collection of works is an ambitious and multi-disciplinary effort to indemnify and articulate the design, implementation and implications of inclusion. Included are theoretical and empirical pieces that examine the related issues at the local, national and international levels. Contributors are grounded in Sociology, Economics, Business Administration, Public Administration, Public Health, Psychology, Anthropology, Social Work, Education, and Natural Resource Management.

**portland state university mechanical engineering: *Biomimetic and Biohybrid Systems***  
Michael Mangan, Mark Cutkosky, Anna Mura, Paul F.M.J. Verschure, Tony Prescott, Nathan Lepora, 2017-07-14 This book constitutes the proceedings of the 6th International Conference on Biomimetic and Biohybrid Systems, Living Machines 2017, held in Stanford, CA, USA, in July 2017. The 42 full and 19 short papers presented in this volume were carefully reviewed and selected from 63 submissions. The theme of the conference encompasses biomimetic methods for manufacture, repair and recycling inspired by natural processes such as reproduction, digestion, morphogenesis and metamorphosis.

**portland state university mechanical engineering: Biomimetic and Biohybrid Systems**  
Vasiliki Vouloutsi, José Halloy, Anna Mura, Michael Mangan, Nathan Lepora, Tony J. Prescott, Paul F.M.J. Verschure, 2018-07-07 This book constitutes the proceedings of the 7th International Conference on Biomimetic and Biohybrid Systems, Living Machines 2018, held in Paris, France, in July 2018. The 40 full and 18 short papers presented in this volume were carefully reviewed and selected from 60 submissions. The theme of the conference targeted at the intersection of research on novel life-like technologies inspired by the scientific investigation of biological systems, biomimetics, and research that seeks to interface biological and artificial systems to create biohybrid systems.

**portland state university mechanical engineering: Machines, Mechanism and Robotics**  
Rajeev Kumar, Vishal S. Chauhan, Mohammad Talha, Himanshu Pathak, 2021-07-21 This volume includes select papers presented during the 4th International and 19th National Conference on Machines and Mechanism (iNaCoMM 2019), held in Indian Institute of Technology, Mandi. It presents research on various aspects of design and analysis of machines and mechanisms by academic and industry researchers.

**portland state university mechanical engineering: **Bicycling Science, fourth edition****  
David Gordon Wilson, Theodor Schmidt, 2020-05-05 THE BIBLE OF TECHNICAL BICYCLING: Everything you need to know about bicycles—from their history to mechanics—is in this updated edition of the classic bicycling book. The perfect gift for cyclists and bicycle enthusiasts! The bicycle is almost unique among human-powered machines in that it uses human muscles in a near-optimum way. This essential volume offers a comprehensive account of the history of bicycles, how human beings propel them, what makes them go faster—and what keeps them from going even faster. Over the years, and through 3 previous editions, Bicycling Science has become the bible of technical bicycling not only for those interested in bicycle design but for cyclist enthusiasts and well. After a brief history of bicycles and bicycling that demolishes many widespread myths, this updated edition covers recent experiments and research on human-powered transportation, with updated material on cycling achievements, human-powered machines for use on land and in air and water, power-assisted bicycles, and human physiology. The authors have also added new information on aerodynamics, rolling drag, transmission of power from rider to wheels, braking, heat management, steering and stability, power and speed, and other topics. This edition also includes many new references and figures. With racks of bikeshare bikes on city sidewalks, and new restrictions on greenhouse gas-emitting cars, bicycle use will only grow. This book is the indispensable companion



for a new era in cycling

**portland state university mechanical engineering:** 3D Microelectronic Packaging Yan Li, Deepak Goyal, 2020-11-23 This book offers a comprehensive reference guide for graduate students and professionals in both academia and industry, covering the fundamentals, architecture, processing details, and applications of 3D microelectronic packaging. It provides readers an in-depth understanding of the latest research and development findings regarding this key industry trend, including TSV, die processing, micro-bumps for LMI and MMI, direct bonding and advanced materials, as well as quality, reliability, fault isolation, and failure analysis for 3D microelectronic packages. Images, tables, and didactic schematics are used to illustrate and elaborate on the concepts discussed. Readers will gain a general grasp of 3D packaging, quality and reliability concerns, and common causes of failure, and will be introduced to developing areas and remaining gaps in 3D packaging that can help inspire future research and development.

**portland state university mechanical engineering:** *Innovations in WASH Impact Measures* Evan Thomas, Luis Alberto Andrés, Christian Borja-Vega, Germán Sturzenegger, 2018-02-14 The new 2030 Agenda for Sustainable Development includes water, sanitation, and hygiene (WASH) at its core. A dedicated Sustainable Development Goal (SDG 6) declares a commitment to ensure availability and sustainable management of water and sanitation for all. Monitoring progress toward this goal will be challenging: direct measures of water and sanitation service quality and use are either expensive or elusive. However, reliance on household surveys poses limitations and likely overstated progress during the Millennium Development Goal period. In *Innovations in WASH Impact Measures: Water and Sanitation Measurement Technologies and Practices to Inform the Sustainable Development Goals*, we review the landscape of proven and emerging technologies, methods, and approaches that can support and improve on the WASH indicators proposed for SDG target 6.1, by 2030, achieve universal and equitable access to safe and affordable drinking water for all, and target 6.2, by 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations. Although some of these technologies and methods are readily available, other promising approaches require further field evaluation and cost reductions. Emergent technologies, methods, and data-sharing platforms are increasingly aligned with program impact monitoring. Improved monitoring of water and sanitation interventions may allow more cost-effective and measurable results. In many cases, technologies and methods allow more complete and impartial data in time to allow program improvements. Of the myriad monitoring and evaluation methods, each has its own advantages and limitations. Surveys, ethnographies, and direct observation give context to more continuous and objective electronic sensor data. Overall, combined methodologies can provide a more comprehensive and instructive depiction of WASH usage and help the international development community measure our progress toward reaching the SDG WASH goals.

**portland state university mechanical engineering:** **Sunrise Corridor Highway 212/224 from I-205 to US 26, Clackamas County**, 2010

**portland state university mechanical engineering:** Food Supply Chain Management Madeleine Pullman, Zhaohui Wu, 2012-05-22 *Food Supply Chain Management: Economic, Social and Environmental Perspectives* is very different from parts supply chain management as can be seen from the increasing health, safety and environmental concerns that are increasingly garnering the public's attention about different food supply chain problems. Food supply chain managers face very different environments. For example, there are very specific regulations from government bodies such as FDA or US Department of Agriculture, commodity subsidy programs, ever-changing trade policies, or increasing trends with intense public interest such as sustainability or bioengineering. While the popular press has written extensively about certain food supply chain issues, these books focus on health effects, specific supply chain practices (buy local vs. commodity supply chain), agricultural policy impacts, and problems in the modern food supply chain. *Food Supply Chain Management* covers the food supply chain comprehensively, and is appropriate for a business student audience and students in agriculture business, natural resources and food science.

**portland state university mechanical engineering: Sustainability Delivered** Madeline Pullman, 2012-04-26 If you are a supply chain manager, an executive, an entrepreneur, or a stakeholder in a sustainable business, this book will help you develop the awareness and skills needed to support sustainable supply chain management in your firm. The authors introduce the many ways that social and environmental responsibility can be integrated into supply chain management, from sustainable product and process design to programs and techniques that support product end-of-life management. The book begins with a discussion of sustainability and business strategy. It then explores product and process design, sustainable purchasing and logistics, and product end-of-life management topics. The authors include real-world examples and cases from some of the world's leading companies in sustainable supply chain management. The examples range from small local companies to large multinational players to give a broad range of ideas to the reader. With case examples, workshops, and step-by-step instructions on how to create a sustainable supply chain, *Sustainability Delivered* is the most practical and usable book on the market that will help you and other business leaders to authentically pursue and deliver on sustainability ideals

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