Ethical Issues In Engineering By Deborah G Johnson

This volume provides the reader with an integrated overview of state-of-the-art research in philosophy and ethics of design in engineering and architecture. It contains twenty-five essays that focus on engineering designing in its traditional sense, on designing in novel engineering domains, and on architectural and environmental designing. This volume enables the reader to overcome the traditional separation between engineering designing and architectural designing.

The aftermath of September 11, 2001, brought the subject of engineering-failure forensics to public attention as had no previous catastrophe. In keeping with the engineering profession's long tradition of building a positive future out of disasters, Lessons amid the Rubble uses the collapse of the World Trade Center towers to explore the nature and future of engineering education in the United States. Sarah K. A. Pfatteicher draws on historical and current practice in engineering design, construction, and curricula to discuss how engineers should conceive, organize, and execute a search for the reasons behind the failure of man-made structures. Her survey traces the analytical journey engineers take after a disaster and discusses the technical, social, and moral implications of their work. After providing an overview of the investigations into the collapse of the Twin Towers, Pfatteicher explores six related events to reveal deceptively simple lessons about the engineering enterprise, each of which embodies an ethical dilemma at the heart of the profession. In tying these themes together, Pfatteicher highlights issues of professionalism and professional identity infused in engineering education and encourages an explicit, direct conversation about their meaning. Sophisticated and engagingly written, this volume combines history, engineering, ethics, and philosophy to provoke a deep discussion about the symbolic meaning of buildings and other structures and the nature of engineering.

This book is divided into six chapters that are designed to create an applicable text for understanding engineering ethics at any level. The author provides a background of the history and developments in engineering over the last 125 years, which are crucial to know as a contemporary engineer. The variety of case studies sprinkled throughout the book are used to highlight ethical issues in real-life situations and the reasons why engineers may have been pressed to engage in one or another form of misconduct. The final chapter is summed up to give a comprehensive overview of the approach to exploring ethical issues in engineering, which the reader is suggested to adopt.

Around the turn of the millennium, a young woman with outstanding academic achievements in science and mathematics applied to study engineering at a Eu- pean university. She had chosen to study engineering particularly because of the opportunities she expected it would give her to make a contribution to the well- ing of others. It happened that the university engineering department to which she applied had just been involved in the design of a vehicle for a world speed record attempt. When the young woman visited the university for interview this "triumph of technology" was presented as being a quintessential example of good engine- ing. However, though it was clear to her that the vehicle was technically ing- ious, she also recognised that it was of no practical use. She concluded that she had misunderstood the nature of engineering, and still wishing to help others she changed her plans and studied medicine, at which she assuredly excelled. This young woman's change of career was undoubtedly a specific loss for en- neering. Additionally, it had a broader, tragic dimension; for her understanding of the purpose of engineering was more mature than that of the academics she - countered. Moreover, their imbalanced prioritisation of technical ingenuity over helping people is not uncommon within parts of the profession.

This text, first published in 1998, examines the ethical responsibilities of engineers for the environment - of interest to all engineers.

An exploration of the ethics of practical engineering through analyses of eighteen rich case studies The Ethical Engineer explores ethical issues that arise in engineering practice, from technology transfer to privacy protection to whistle-blowing. Presenting key ethics concepts and real-life examples of engineering work, Robert McGinn illuminates the ethical dimension of engineering practice and helps students and professionals determine engineers' context-specific ethical responsibilities. McGinn highlights the "ethics gap" in contemporary engineering--the disconnect between the meager exposure to ethical issues in engineering education and the ethical challenges frequently faced by engineers. He elaborates four "fundamental ethical responsibilities of engineers" (FEREs) and uses them to shed light on the ethical dimensions of diverse case studies, including ones from emerging engineering fields. The cases range from the Union Carbide pesticide plant disaster in India to the Google Street View project. After examining the extent to which the actions of engineers in the cases align with the FEREs, McGinn recapitulates key ideas used in analyzing the cases and spells out the main lessons they suggest. He identifies technical, social, and personal factors that induce or press engineers to engage in misconduct and discusses organizational, legal, and individual resources available to those interested in ethically responsible engineering practice. Combining probing analysis and nuanced ethical evaluation of engineering conduct in its social and technical contexts, The Ethical Engineer will be invaluable to engineering students and professionals. Meets the need for engineering-related ethics study Elaborates four fundamental ethical responsibilities of engineers Discusses diverse, global cases of ethical issues in established and emerging engineering fields Identifies resources and options for ethically responsible engineering practice Provides discussion questions for each case

"In SOCIAL, ETHICAL, AND POLICY IMPLICATIONS OF ENGINEERING,engineers, faculty, and students will find an informative guide tothe professional, societal, and ethical responsibilities that facepracticing engineers today. Through an integrated approach to thetheory of engineering ethics and practical real-world issues, thiscomprehensive book offers readers an in-depth analysis oftechnology's current social role. Drawing on readings and case studies first published in IEEETechnology and Society Magazine, this easy-to-read text willdevelop readers' understanding of the important issues surrounding""macroethical"" public policy debates, including discussions ofsustainable development, public health, risk and product liability,and telecommunications. These cases and readings also provide anopportunity to apply the theory in real-world situations. SOCIAL, ETHICAL, AND POLICY IMPLICATIONS OF ENGINEERING will helpstudents meet the new accreditation criteria for engineeringadopted by the Accreditation Board for Engineering and Technology(ABET). In addition, contemporary issues presented in thisfar-reaching book will allow students and practicing engineers togain greater insight into how social and ethical concerns shapecontributions to the engineering field. For more information and related articles gotowww4.ncsu.edu/unity/users/j/jherkert/jrh.html Professors: To request an examination copy simply e-mailcollegeadoption@ieee.org." Sponsored by: IEEE Social Implications of Technology Society

Now in its fourth edition, Martin and Schinzinger's Ethics in Engineering provides an introduction to the key issues in engineering ethics, taking account of both specific organizational contexts and broader technological trends. Current and thorough, it promotes critical thinking and discussion about moral and ethical issues that engineers face. The up-to-date content provides real world examples and cases and, by offering a framework for understanding ethical dilemmas within engineering, prepares readers for issues they will confront in their careers.

Engineers and ethicists participated in a workshop to discuss the responsible development of

new technologies. Presenters examined four areas of engineering--sustainability, nanotechnology, neurotechnology, and energy--in terms of the ethical issues they present to engineers in particular and society as a whole. Approaches to ethical issues include: analyzing the factual, conceptual, application, and moral aspects of an issue; evaluating the risks and responsibilities of a particular course of action; and using theories of ethics or codes of ethics developed by engineering societies as a basis for decision making. Ethics can be built into the education of engineering students and professionals, either as an aspect of courses already being taught or as a component of engineering projects to be examined along with research findings. Engineering practice workshops can also be effective, particularly when they include discussions with experienced engineers. This volume includes papers on all of these topics by experts in many fields. The consensus among workshop participants is that material on ethics should be an ongoing part of engineering education and engineering practice.

For most professions, a code of ethics exists to promote positive behavior among practitioners in order to enrich others within the field as well as the communities they serve. Similar to the medical, law, and business fields, the engineering discipline also instills a code of ethical conduct. Contemporary Ethical Issues in Engineering highlights a modern approach to the topic of engineering ethics and the current moral dilemmas facing practitioners in the field. Focusing on key issues, theoretical foundations, and the best methods for promoting engineering ethics from the pre-practitioner to the managerial level, this timely publication is ideally designed for use by engineering students, active professionals, and academics, as well as researchers in all disciplines of engineering.

Bridging the gap between theory and practice, ENGINEERING ETHICS, Fifth Edition, will help you quickly understand the importance of your conduct as a professional and how your actions can affect the health, safety, and welfare of the public. ENGINEERING ETHICS, Fifth Edition, provides dozens of diverse engineering cases and a proven and structured method for analyzing them; practical application of the Engineering Code of Ethics; focus on critical moral reasoning as well as effective organizational communication; and in-depth treatment of issues such as sustainability, acceptable risk, whistle-blowing, and globalized standards for engineering. Additionally, a new companion website offers study questions, self-tests, and additional case studies. Available with InfoTrac Student Collections http://gocengage.com/infotrac. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Ethical practice in engineering is critical for ensuring public trust in the field and in its practitioners, especially as engineers increasingly tackle international and socially complex problems that combine technical and ethical challenges. This report aims to raise awareness of the variety of exceptional programs and strategies for improving engineers' understanding of ethical and social issues and provides a resource for those who seek to improve ethical development of engineers at their own institutions. This publication presents 25 activities and programs that are exemplary in their approach to infusing ethics into the development of engineering students. It is intended to serve as a resource for institutions of higher education seeking to enhance their efforts in this area.

Ensuring that their work has a positive influence on society is a responsibility and a privilege for engineers, but also a considerable challenge. This book addresses the ways in which engineers meet this challenge, working from the assumption that for a project to be truly ethical both the undertaking itself and its implementation must be ethically sound. The contributors discuss varied topics from an international and interdisciplinary perspective, including l robot ethics; l outer space; l international development; l internet privacy and security; l green branding; l arms conversion; l green employment; and l deliberate misinformation about climate change Important questions are answered, such as l what is meant by engineering ethics and its practical implications; l how decisions made by engineers in their working lives make an

impact at the global as well as the local level; and I what ethics-related questions should be asked before making such decisions. Ethical Engineering for International Development and Environmental Sustainability will be a valuable resource for practising and student engineers as well as all who are interested in professional ethics, especially as it relates to engineering. Researchers and policy makers concerned with the effects of engineering decisions on environmental sustainability and international stability will find this book to be of special interest.

Engineering Ethics is ideal for use in undergraduate engineering programs incorporating ethics topics. Engineering Ethics serves as both a textbook and a resource for the study of engineering ethics. It is written to help future engineers be prepared for confronting and resolving ethical dilemmas that they might encounter during their professional careers.

For engineering and scientific endeavors to progress there must be generally accepted ethical guidelines in place to which engineers and scientists must adhere. This book explores the various scientific and engineering disciplines, examining the potential for unethical behavior by professionals. Documented examples are presented to show where unethical behavior could have been halted before it became an issue. The authors also look to the future to see what is in store for professionals in the scientific and engineering disciplines and how the potential for unethical behavior can be negated.

An exploration of the ethics of practical engineering through analyses of eighteen rich case studies The Ethical Engineer explores ethical issues that arise in engineering practice, from technology transfer to privacy protection to whistle-blowing. Presenting key ethics concepts and real-life examples of engineering work, Robert McGinn illuminates the ethical dimension of engineering practice and helps students and professionals determine engineers' context-specific ethical responsibilities. McGinn highlights the "ethics gap" in contemporary engineering—the disconnect between the meager exposure to ethical issues in engineering education and the ethical challenges frequently faced by engineers. He elaborates four "fundamental ethical responsibilities of engineers" (FEREs) and uses them to shed light on the ethical dimensions of diverse case studies, including ones from emerging engineering fields. The cases range from the Union Carbide pesticide plant disaster in India to the Google Street View project. After examining the extent to which the actions of engineers in the cases align with the FEREs, McGinn recapitulates key ideas used in analyzing the cases and spells out the main lessons they suggest. He identifies technical, social, and personal factors that induce or press engineers to engage in misconduct and discusses organizational, legal, and individual resources available to those interested in ethically responsible engineering practice. Combining probing analysis and nuanced ethical evaluation of engineering conduct in its social and technical contexts, The Ethical Engineer will be invaluable to engineering students and professionals. Meets the need for engineering-related ethics study Elaborates four fundamental ethical responsibilities of engineers Discusses diverse, global cases of ethical issues in established and emerging engineering fields Identifies resources and options for ethically responsible engineering practice Provides discussion questions for each case Biomedical Ethics for Engineers provides biomedical engineers with a new set of tools and an understanding that the application of ethical measures will seldom reach consensus even among fellow engineers and scientists. The solutions are never completely technical, so the engineer must continue to improve the means of incorporating a wide array of societal perspectives, without sacrificing sound science and good design principles. Dan Vallero understands that engineering is a profession that profoundly affects the quality of life from the subcellular and nano to the planetary scale. Protecting and enhancing life is the essence of ethics; thus every engineer and design professional needs a foundation in bioethics. In high-profile emerging fields such as nanotechnology, biotechnology and green engineering, public concerns and attitudes become especially crucial factors given the inherent uncertainties and

high stakes involved. Ethics thus means more than a commitment to abide by professional norms of conduct. This book discusses the full suite of emerging biomedical and environmental issues that must be addressed by engineers and scientists within a global and societal context. In addition it gives technical professionals tools to recognize and address bioethical questions and illustrates that an understanding of the application of these measures will seldom reach consensus even among fellow engineers and scientists. · Working tool for biomedical engineers in the new age of technology · Numerous case studies to illustrate the direct application of ethical techniques and standards · Ancillary materials available online for easy integration into any academic program

Engineering begins with a design problem: how to make occupants of vehicles safer, settle on an inter-face for an x-ray machine or create more legible road signs. In choosing any particular solution, engineers must make value choices. By focusing on the solving of these problems, Ethics Within Engineering shows how ethics is at the intellectual core of engineering. Built around a number of engaging case studies, Wade Robison presents real examples of engineering problems that everyone, engineer or not, will recognize, ranging from such simple artifacts as toasters and the layout of burners and knobs on a stove top to the software responsible for the Columbia airliner crash. The most dramatic examples center on error-provocative designs: designs that provoke mistakes for even the most intelligent, well-informed, and highly motivated. These examples all raise ethical issues, posing questions for the reader, forcing the give-and-take of discussion in classrooms and the consideration of alternative solutions that solve the original design problem without the unfortunate features of the original solution. This original, focused approach provides an ideal entry point for anyone looking to better understand professional ethical responsibilities within engineering.

An engaging, accessible survey of the ethical issues faced by engineers, designed for students The first engineering ethics textbook to use debates as the framework for presenting engineering ethics topics, this engaging, accessible survey explores the most difficult and controversial issues that engineers face in daily practice. Written by a leading scholar in the field of engineering and computer ethics, Deborah Johnson approaches engineering ethics with three premises: that engineering is both a technical and a social endeavor; that engineers don't just build things, they build society; and that engineering is an inherently ethical enterprise.

Human genetic engineering may soon be possible. The gathering debate about this prospect already threatens to become mired in irresolvable disagreement. After surveying the scientific and technological developments that have brought us to this pass, The Ethics of Genetic Engineering focuses on the ethical and policy debate, noting the deep divide that separates proponents and opponents. The book locates the source of this divide in differing framing assumptions: reductionist pluralist on one side, holist communitarian on the other. The book argues that we must bridge this divide, drawing on the resources from both encampments, if we are to understand and cope with the distinctive problems posed by genetic engineering. These problems, termed "fractious problems," are novel, complex, ethically fraught, unavoidably of public concern, and unavoidably divisive. Berry examines three prominent ethical and political theories – utilitarianism, Kantianism, and virtue ethics – to consider their competency in bridging the divide and addressing these fractious problems. The book concludes that virtue ethics can best guide parental decision making and that a new policymaking approach sketched here, a "navigational approach," can best guide policymaking. These approaches enable us to gain a rich understanding of the problems posed and to craft resolutions adequate to their challenges.

This volume identifies, discusses and addresses the wide array of ethical issues that have emerged for engineers due to the rise of a global economy. To date, there has been no systematic treatment of the particular challenges globalization poses for engineering ethics

standards and education. This volume concentrates on precisely this challenge. Scholars and practitioners from diverse national and professional backgrounds discuss the ethical issues emerging from the inherent symbiotic relationship between the engineering profession and globalization. Through their discussions a deeper and more complete understanding of the precise ways in which globalization impacts the formulation and justification of ethical standards in engineering as well as the curriculum and pedagogy of engineering ethics education emerges. The world today is witnessing an unprecedented demand for engineers and other science and technology professionals with advanced degrees due to both the off-shoring of western jobs and the rapid development of non-Western countries. The current flow of technology and professionals is from the West to the rest of the world. Professional practices followed by Western (or Western-trained) engineers are often based on presuppositions which can be in fundamental disagreement with the viewpoints of non-Westerners. A successful engineering solution cannot be simply technically sound, but also must account for cultural, social and religious constraints. For these reasons, existing Western standards cannot simply be exported to other countries. Divided into two parts, Part I of the volume provides an overview of particular dimensions of globalization and the criteria that an adequate engineering ethics framework must satisfy in a globalized world. Part II of the volume considers pedagogical challenges and aims in engineering ethics education that is global in character.

Featuring a wide range of international case studies, Ethics, Technology, and Engineering presents a unique and systematic approach for engineering students to deal with the ethical issues that are increasingly inherent in engineering practice. Utilizes a systematic approach to ethical case analysis -- the ethical cycle -- which features a wide range of real-life international case studies including the Challenger Space Shuttle, the Herald of Free Enterprise and biofuels. Covers a broad range of topics, including ethics in design, risks, responsibility, sustainability, and emerging technologies Can be used in conjunction with the online ethics tool Agora (http://www.ethicsandtechnology.com) Provides engineering students with a clear introduction to the main ethical theories Includes an extensive glossary with key terms

This book focuses on the ethical issues in engineering that have to do with assessment, design, sustainability and globalization.

"This book highlights a modern approach to the topic of engineering ethics and the current moral dilemmas facing practitioners in the field by focusing on key issues, theoretical foundations, and the best methods for promoting engineering ethics from the pre-practitioner to the managerial level"--

Global Engineering Ethics introduces the fundamentals of ethics in a context specific to engineering without privileging any one national or cultural conception of ethics. Numerous case studies from around the world help the reader to see clearly the relevance of design, safety, and professionalism to engineers. Engineering increasingly takes place in global contexts, with industrial and research teams operating across national and cultural borders. This adds a layer of complexity to already challenging ethical issues. This book is essential reading for anyone wanting to understand or communicate the ethics of engineering, including students, academics, and researchers, and is indispensable for those involved in international and cross-cultural environments. Takes a global-values approach to engineering ethics rather than prioritizing any one national or regional culture Uses engineering case studies to explain ethical issues and principles in relatable, practical contexts Approaches engineering from a business perspective, emphasizing the extent to which engineering occurs in terms of profit-driven markets, addressing potential conflicts that arise as a result Provides extensive guidance on how to carry out ethical analysis by using case studies, to practice addressing and thinking through issues before confronting them in the world

Engineering the Farm offers a wide-ranging examination of the social and ethical issues

surrounding the production and consumption of genetically modified organisms (GMOs), with leading thinkers and activists taking a broad theoretical approach to the subject. Topics covered include: the historical roots of the anti-biotechnology movement ethical issues involved in introducing genetically altered crops questions of patenting and labeling the "precautionary principle" and its role in the regulation of GMOs effects of genetic modification on the world's food supply ecological concerns and impacts on traditional varieties of domesticated crops potential health effects of GMOsContributors argue that the scope, scale, and size of the present venture in crop modification is so vast and intensive that a thoroughgoing review of agricultural biotechnology must consider its global, moral, cultural, and ecological impacts as well as its effects on individual consumers. Throughout, they argue that more research is needed on genetically modified food and that consumers are entitled to specific information about how food products have been developed.Despite its increasing role in worldwide food production, little has been written about the broader social and ethical implications of GMOs. Engineering the Farm offers a unique approach to the subject for academics, activists, and policymakers involved with questions of environmental policy, ethics, agriculture, environmental health, and related fields.

For use in undergraduate engineering programs incorporating ethics topics. Engineering Ethics serves as both a textbook and a resource for the study of engineering ethics. It is written to help future engineers be prepared for confronting and resolving ethical dilemmas that they might encounter during their professional careers.

Engineering Ethics: Challenges and Opportunities aims to set a new agenda for the engineering profession by developing a key challenge: can the great technical innovation of engineering be matched by a corresponding innovation in the acceptance and expression of ethical responsibility? Central features of this stimulating text include: · An analysis of engineering as a technical and ethical practice providing great opportunities for promoting the wellbeing and agency of individuals and communities. · Elucidation of the ethical opportunities of engineering in three key areas: Engineering for Peace, emphasising practical amelioration of the root causes of conflict rather than military solutions. Engineering for Health, focusing on close collaboration with healthcare professionals for both the promotion and restoration of health. Engineering for Development, providing effective solutions for the reduction of extreme poverty. · Innovative strategies for implementing these ethical opportunities are described: Emphasis on the personal responsibility of every engineer and on the benefits of supporting social structures. Use of language and concepts that are appealing to business managers and political decision makers. · Future prospects for increasing the acceptance and expression of ethical responsibility by engineers are envisaged. · Engineering Ethics: Challenges and Opportunities provides engineers, decision makers and the wider public with new understanding of the potential of engineering for the promotion of human flourishing.

Ethical Issues in EngineeringPearson College Division

Starrett, Lara, and Bertha provide in-depth analysis of real world engineering ethics cases studies with extended discussions and study questions.

This anthology focuses on ethical issues confronting individual engineers and the entire engineering profession.

The first edition of Caroline Whitbeck's Ethics in Engineering Practice and Research focused on the difficult ethical problems engineers encounter in their practice and in research. In many ways, these problems are like design problems: they are complex, often ill defined; resolving them involves an iterative process of analysis and synthesis; and there can be more than one acceptable solution. In the second edition of this text, Dr Whitbeck goes above and beyond by featuring more real-life problems, stating recent scenarios and laying the foundation of ethical concepts and reasoning. This book offers a real-world, problem-centered approach to engineering ethics, using a rich collection of open-ended case studies to develop skill in

recognizing and addressing ethical issues.

Leaders from academia and industry offer guidance for professionals and general readers on ethical questions posed by modern technology.

A guide to understanding and resolving the knotty ethical issues confronting today's engineering professional Little in an engineer's formal training offers adequate preparation for navigating the murky waters of professional ethics. Engineering and Environmental Ethics fills this critical gap, providing you with a reliable compass to help steer a safe course through the welter of governing laws and regulations, while balancing personal and professional obligations with the more global concerns of the environment and society. This book offers the opportunity to learn directly from your colleagues' experiences through more than 100 absorbing case studies that typify common ethical problems encountered by engineers. Taking a neutral viewpoint for each case, the authors supply helpful commentaries in which they address underlying philosophical issues, weigh the various pros and cons of possible responses, and offer expert opinions on how the problem could have been resolved better or differently. The cases are organized both by engineering specialty (chemical, civil, electrical, and mechanical) and by environmental concerns (air, water, solid waste, domestic, and safety and accident management). Engineering and Environmental Ethics is a valuable professional resource for practitioners in all engineering specialties, as well as corporate policymakers and environmental managers. It can also serve as an excellent primary or secondary text for engineering students enrolled in professional ethics courses.

Along with the introduction of technology in nearly every facet of human life comes the question of the ethical side of using technology to improve the human condition, whether that be physically or mentally. The capabilities of human enhancement technologies have created a dual-sided approach to discussing human enhancement: the critical approach of attempting to reach human perfection and the ethics within that idea and the endless capabilities of technology that have greatly impacted the medical field. It is essential to discuss both aspects within these emerging technologies, whether as separate entities or as cohesive units. Ranging from disease detection and treatment to implants and prosthetics to robotics and genetic engineering, human enhancement technologies are widespread and multi-purposed. By going beyond the capabilities of human hands, these technologies have propelled modern medicine and healthcare to new levels that have allowed humans to face new treatments or assistive technologies not seen before. The Research Anthology on Emerging Technologies and Ethical Implications in Human Enhancement covers the primary technologies and tools being used in medicine and healthcare along with discussions on the ethics of enhancing the human body. Topics covered include prosthetics and implants, robotics, human disorders/diseases and treatments and smart technologies, along with law and theory. This publication serves as a valuable reference work for doctors, medical professionals, researchers, students, professionals, and practitioners involved in fields that include ethics, medicine, computer science, robotics, genetics, assistive technologies, nanotechnology, biomedical engineering, and biotechnology.

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