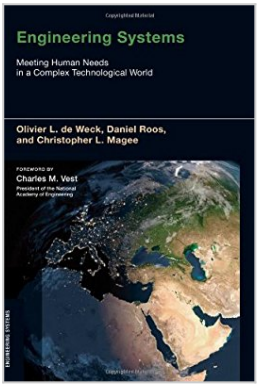

Engineering Systems: Meeting Human Needs in a Complex Technological World

By Olivier L. de Weck, Daniel Roos, Christopher L. Magee

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Engineering, for much of the twentieth century, was mainly about artifacts and inventions. Now, it's increasingly about complex systems. As the airplane taxis to the gate, you access the Internet and check email with your PDA, linking the communication and transportation systems. At home, you recharge your plug-in hybrid vehicle, linking transportation to the electricity grid. Today's large-scale, highly complex sociotechnical systems converge, interact, and depend on each other in ways engineers of old could barely have imagined. As scale, scope, and complexity increase, engineers consider technical and social issues together in a highly integrated way as they design flexible, adaptable, robust systems that can be easily modified and reconfigured to satisfy changing requirements and new technological opportunities.

Engineering Systems offers a comprehensive examination of such systems and the associated emerging field of study. Through scholarly discussion, concrete examples, and history, the authors consider the engineer's changing role, new ways to model and analyze these systems, the impacts on engineering education, and the future challenges of meeting human needs through the technologically enabled systems of today and tomorrow.

Engineering Systems: Meeting Human Needs in a Complex Technological World

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Editorial Review

Review

I believe that this book is a first. It defines a new and emerging discipline -- engineering systems. The authors give us the theories, concepts, and tools which are necessary to situate engineering problems in a broader and fundamentally relevant context, thereby permitting more complete and useful solutions to current challenges.

(**John S. Reed**, Chairman of the Corporation, MIT)

This is an extraordinarily readable book that brings the literature of Engineering Systems to a new level. Engineering in the future will increasingly integrate the physical and biological sciences -- and humans -- to perform amazing new functions. Anyone who has ever wondered why start must be clicked to turn off a computer needs to read this book! It would have been required reading had it existed at the time I was teaching at Princeton University.

(**Norman R. Augustine**, Retired Chairman and CEO, Lockheed Martin Corporation, Former Under Secretary of the Army, and Former Chairman, National Academy of Engineering)

This book is timely. New thinking is urgently needed in order to manage and thrive in our world of complex systems and systems of systems. Our students, the leaders of tomorrow, must learn and apply engineering systems skills in business, communications, transportation, energy, education, healthcare delivery, public health, and global health. This book marvelously demonstrates why the system-thinking skills required must include the domains of strategic planning, public policy, social sciences, management, and engineering.

(**Denis A. Cortese, M.D.**, Foundation Professor and Director of the Healthcare Delivery and Policy Program, Arizona State University; President of the Healthcare Transformation Institute; Emeritus President and CEO of Mayo Clinic)

Not since the work of Eberhardt Rechtin on establishing the field of Systems Architecting have I encountered a book with a broader scope and more potent conceptual approach. *Engineering Systems* provides a solid framework for expanding the principles of engineering to address the complexities beyond technical science that are necessary to master the Grand Challenges of our age. I believe it will change the way we think about the field of engineering.

(**Richard K. Miller**, President, Franklin W. Olin College of Engineering)

About the Author

Olivier L. de Weck is Professor of Aeronautics and Astronautics and Engineering Systems at MIT. Daniel Roos, Founding Director of Engineering Systems Division, is Japan Steel Industry Professor of Engineering Systems and Civil and Environmental Engineering, Emeritus, at MIT. Christopher L. Magee is Professor of the Practice of Mechanical Engineering and Engineering Systems at MIT, where he is also Codirector of the

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