



Rethinking Engineering Education: The CDIO Approach

By *Edward F. Crawley, Johan Malmqvist, Sören Östlund, Doris R. Brodeur, Kristina Edström*

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This book describes an approach to engineering education that integrates a comprehensive set of personal, interpersonal, and professional engineering skills with engineering disciplinary knowledge in order to prepare innovative and entrepreneurial engineers. The education of engineers is set in the context of engineering practice, that is, *Conceiving, Designing, Implementing, and Operating* (CDIO) through the entire lifecycle of engineering processes, products, and systems. The book is both a description of the development and implementation of the CDIO model and a guide to engineering programs worldwide that seek to improve the education of young engineers.

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Editorial Review

From the Back Cover

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- Provides an overview of the CDIO approach, then chapters organized according to the CDIO Standards;
- Includes in each chapter objectives, discussion questions, case studies and clear diagrams to support key concepts and processes;
- Avoids the jargon of education specialists and clearly explains education terms in the context of their initial presentation.

About the Author

EDWARD F. CRAWLEY is the founding President of the Skolkovo Institute of Science and Technology (Skoltech) in Moscow. Prior to this, he led the Gordon – MIT Engineering Leadership Program, the Cambridge-MIT Institute, and the MIT Department of Aeronautics and Astronautics. He served as the founding co-director of the CDIO Initiative and received the Bernard M. Gordon Prize from the National Academy of Engineering (U.S.). He is a member of the Royal Swedish Academy of Engineering Science, the Royal Academy of Engineering (U.K.), the Chinese Academy of Engineering, as well as the National Academy of Engineering (U.S.). He earned a S.B. (1976) and a S.M. (1978) in aeronautics and astronautics from MIT and a Sc.D. (1981) in aerospace structures from MIT.

JOHAN MALMQVIST is Professor of Product Development at Chalmers University of Technology in Gothenburg, Sweden, one of the four founding universities of the CDIO Initiative. He serves as Dean of Education and directs programs in mechanical, automation, industrial design, and maritime engineering. He is a founding co-director of the CDIO Initiative, which he continues to lead as co-director. He received the Janne Carlsson Scholarship for Academic Leadership from KTH - Royal Institute of Technology. He earned a M.Sc. Eng. (1988) in mechanical engineering and a Ph.D. (1993) in machine and vehicle design from Chalmers.

SÖREN ÖSTLUND is Professor of Packing Technology at KTH - Royal Institute of Technology, one of the four founding universities of the CDIO Initiative. He served on the CDIO Council from 2001 to 2005. For ten years, he was Manager of the Vehicle Engineering program at KTH, a program that received the Center of Excellent Quality in Higher Education Award in 2007 from the Swedish National Agency for Higher Education. He holds a M.Sc. in aeronautical engineering from KTH and a Ph.D. in solid mechanics from KTH.

DORIS R. BRODEUR is an Assessment and Evaluation Specialist, recently retired from the Massachusetts Institute of Technology, who has been involved in the CDIO Initiative since its inception. She gives workshops for engineering faculty on curriculum design, teaching methods, assessment and evaluation. For the past eight years, she has been consulting with universities in Chile, Colombia, Honduras, and Guatemala. She helped to establish the Latin America CDIO Region. She holds B.A. (1973) and M.Ed. (1977) degrees in education from colleges in Massachusetts and a Ph.D. (1980) in instructional systems from Indiana University.

KRISTINA EDSTRÖM is Associate Professor in Engineering Education Development at KTH - Royal Institute of Technology, one of the four founding universities of the CDIO Initiative. She has been leading educational development activities in Sweden and internationally for more than fifteen years. She served on the CDIO Council from 2005 to 2013 and the SEFI Administrative Council from 2010 to 2013. During 2012-2013 academic year, she was also Director of Educational Development at Skolkovo Institute of Science and Technology (Skoltech) in Russia. More than 600 participants have taken her course, Teaching and Learning in Higher Education (7.5 ECTS), customized for engineering faculty. She has a M.Sc. in engineering from Chalmers University of Technology.

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