

# Handbook of Research on Recent Developments in Materials Science and Corrosion Engineering Education

Part of the Advances in Chemical and Materials Engineering (ACME) Book Series

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## Description:

The Materials Science and Engineering (MSE) discipline is highly dynamic and has undergone many changes in response to revolutionary inventions and improved technologies (polymers, ceramics, nanomaterials, metamaterials, etc.) that are extensively documented in engineering publications available in the market. These changes in the discipline have invariably filtered down to impact the structure and content of MSE educational and training programs. Yet there are no significant publications that encapsulate the recent developments and trends in MSE education. The purpose of this edited book is to fill this gap by disseminating the challenges and successes in the development of innovative, effective instructional approaches for MSE education and training that can produce the next generation of skilled engineering professionals to solve global materials problems. This book satisfies a long-felt need among academics and practitioners for such a pedagogical resource, and creates a sustained interest in the future of MSE education.

The book is divided into four sections with 21 chapters:

- Section 1 Theme: Innovations in Materials Science and Engineering degree course curricula.
- Section 2 Theme: Incorporating information technology into Materials Science and Engineering and Corrosion Education.
- Section 3 Theme: Interdisciplinary approaches in MSE teaching and training.
- Section 4 Theme: Engineers at work: Professional skills and career development

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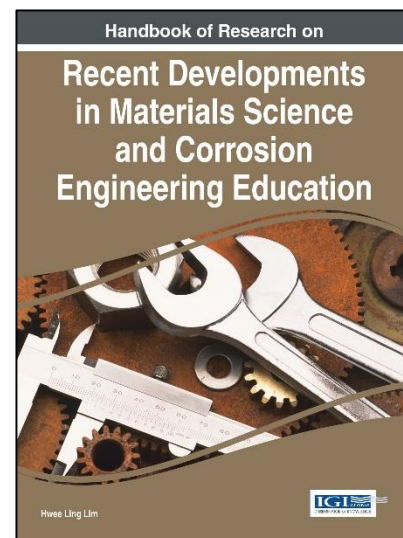
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## Topics Covered:

- Teaching "Design-for-Corrosion"
- Innovative Materials Capstone Courses
- Materials Design and Manufacturing Challenges in the Automotive Industry
- Interdisciplinary Project-Based Infrastructure Degradation Curriculum
- Green Inhibitors for Corrosion: Research and Education
- Virtual Environments in Materials Science and Engineering
- Artificial Intelligence and Applications in Civil Engineering
- Digital Libraries in Teaching Materials Science and Engineering
- Nanostructured Materials Science and Engineering
- Materials and Mechanics
- Sustainable Engineering Principles in Material Science Engineering Education
- Health, Safety and Environment (HSE) through Design
- Arabian Gulf Materials Programs
- Cultural Heritage Career Paths in Materials Science and Corrosion Engineering
- Introducing Professional Skills into the Engineering Curriculum
- Engaging Female Professionals in the Arabian Gulf Petroleum Industry



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*Chong Cheng, The State University of New York, USA*

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*Figen Daver, RMIT University, Australia*

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*Tabar El-Korchi, Worcester Polytechnic Institute, USA*

*Rick D. Sisson Jr., Worcester Polytechnic Institute, USA*

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*Hwee Ling Lim, The Petroleum Institute, United Arab Emirates*

**Hwee Ling Lim** is an Associate Professor at the Petroleum Institute in Abu Dhabi, United Arab Emirates (UAE). She obtained her Bachelor and Master degrees from The National University of Singapore (Singapore) as well as a postgraduate Diploma in Education from The National Institute of Education (Nanyang Technological University, Singapore). She has a Ph. D (Information Technology) from Murdoch University, Perth, Australia. Her areas of research include educational technology, computer-mediated communication, electronic discourse analysis and more recently, engineering education and human resource management. She has published over 40 works that included books, edited books, book chapters, journal papers and conference proceedings. She received an award for best research paper at the 2007 Computer Science and Information Technology Education Conference (CSITED). Lim is an Editorial Review Board member for the Journal of Information Technology Education: Research, and Journal of Information Technology Education: Innovations in Practice. She is a regular reviewer for annual international conferences. Lim has given invited talks on engineering education in international conferences held in Doha, Qatar (Material Science and Engineering Symposium 2012) and Abu Dhabi, UAE (Corrosion UAE 2013; ADNOC Research and Development Academic Conference 2013).