

## INVITATION FOR BOOK CHAPTER CONTRIBUTION

Dear Colleagues,

I will like to seize this opportunity to notify you of the current project my colleagues and I have with **Springer Nature Publisher**, 233 Spring Street, New York, NY 10013, to produce an edited book on Sustainable Engineering: Concepts and Practices. Please see pp. 2-5 of this document for more information about the book.

As researchers/investigators/experts in this field, I will be very grateful if you could contribute to the book. If you are willing to contribute a chapter to the book, kindly read through this document for sections of the book and signify an expression of interest by sending me the following as soon as possible, but not later than **25<sup>th</sup> August 2022**:

- (a) A 200 words abstract with the title of the contribution
- (b) Names and affiliations of the authors and their full contact details
- (c) Proposed section where the chapter should be categorized
- (d) 6 keywords for the intended chapter

The abstract should include the objectives of the chapter, the methods used and the findings (where applicable), and implications of your work for future sustainable engineering research and practice.

For further clarification, you are welcome to write me an e-mail via [sustainabletextbook@gmail.com](mailto:sustainabletextbook@gmail.com) or [idunmade@mtroyal.ca](mailto:idunmade@mtroyal.ca)

## EDITORS AND TITLE INFORMATION

Proposed title of the edited book:

### **Sustainable Engineering - Concepts and Practices**

#### **Introduction**

Sustainable Engineering is a relatively new concept within the frame of sustainable development, although it has been receiving some attention in recent years from scholars and professionals.

Sustainable Engineering was defined by Thorn et al (2011) as "the integration of social, environmental, and economic considerations into product, process, and energy system design methods" while a Florida company called Sustainable Engineering & Design LLC (2016) defined it as "the creative process of utilizing science and technology, making use of energy and resources at a rate which does not compromise the integrity of the natural environment, or the ability of future generations to meet their own needs. While each of the two definitions seemed to have captured most aspects of what is done in sustainable engineering, they appeared incomplete because their definitions placed the entire responsibility on the manufacturers only. The most practical and all-encompassing definition by Dunmade (2016) refers to sustainable engineering as "an interdisciplinary and multifaceted approach to adaptive integration of supply side and consumer side of an engineered system over its lifecycle stages by utilizing various methods in a technically sound, socio-economically sensible and environmentally friendly manner". Sustainable Engineering is evolutionary in that improvements are incorporated as new knowledge and experiences gained.

#### **Background**

Engineering has contributed significantly to the world civilization and economic development as we know it today. For centuries, engineers have progressively developed systems and machinery; built communication, energy, food, healthcare and water supply infrastructure, and various other human-life improvement facilities. Unfortunately, engineering has also inadvertently contributed to environmental damages and socio-cultural issues that we see all around today. However, scholars and engineering professionals have been working hard to incorporate sustainability concepts into their practices by making changes that minimize environmental impacts across the entire lifecycle while simultaneously maximizing the benefits to social and economic stakeholders. These improvements are not limited to only one branch of engineering, a lot of changes are happening across a broad spectrum of engineering disciplines (Thorn, Brownell and Carrano, 2011).

#### **About the Project**

The main goal of this publication project is to explore new developments and showcase innovations regarding how researchers and professionals across various branches of engineering

are incorporating sustainability concepts and practices into their works. It is also the objective of this book to highlight various factors that affect sustainable engineering and how sustainable engineering affect other societal needs. Furthermore, it is the aim of this book to make it as comprehensive as possible in order to enable it serve as a good reference book for professionals across various branches of engineering that are interested in incorporating sustainability to their works. For these reasons, contributions to this book is categorized into 11 main sections, namely:

#### SECTION A: Biotechnology and Sustainable Engineering

This section will concentrate on laboratory and industry scale research and development results on the exploration, extraction, exploitation, and production of high value-added products from any living organisms and any source of biomass that does not only focused on technical optimization but also emphasized the use of economically, environmentally and/or socio-culturally sustainable methods. Such methods could involve the utilization of various types of biological processes, organisms or systems to create products that are aimed at improving human lives. Chapters to be included in this section would also consider contributions that focused on challenges in incorporating sustainability into biotechnology engineering and future outlook in this area.

#### SECTION B: Sustainable Engineering in the Construction Industry

Chapters included in this section would be those that deals with the use of sustainable approaches to designing, planning, construction and management of infrastructure such as roads, tunnels, bridges, airports, railroads, facilities, buildings, dams, utilities and other related projects. Those chapters that discussed how conventional approaches are modified to encourage and/or improve sustainability in the construction industry will be highly welcome. Just like in other sections, chapters that elucidate current challenges and future outlook in this area would be accepted for inclusion.

#### SECTION C: Design, Manufacturing and Sustainable Engineering

This section welcomes contributions that discuss laboratory and industry-based environmental friendly, ergonomically considerate and economically viable approaches to designing or engineering a product, process or system in order to facilitate manufacturing, demanufacturing, remanufacturing, reuse, upgrading, cascading, manufacturing technology proliferation and other activities along the product lifecycle in such a way that the whole activities result in the overall reduction in resource use; elimination or reduction in wastes; cost minimization, and/or promotion of systems' multi-lifecycle. Engineered products considered could range from simple implements, tools and components to complex products such as aircraft, household appliances, furniture, sports equipment, automobiles, military hardware, aerospace equipment and/or marine equipment. Chapters that cover challenges in developing and utilizing the aforementioned approaches in the real world will be acceptable. Contributions that discuss sustainability in manufacturing process optimization, material specification and future outlook in sustainable design and manufacturing area are also welcome.

#### SECTION D: Sustainability in Process, Materials, Mining and Metallurgical Engineering

This section would cover topics that discuss how sustainability concept is applied in the design, operation, control, optimization and intensification of chemical and physical processes, especially as it relates to material development, mining, nuclear, petrochemical, pharmaceutical, and software development. Chapters that dealt with sustainability in process systems engineering is highly encouraged. Contributions that discussed challenges and future outlook in process, Materials, Mining and Metallurgical Engineering are also welcome.

#### SECTION E: Food-Water-Energy Nexus and Sustainable Engineering

This section would cover topics that discuss sustainable production of food, water and energy as well as how they affect each other. Contributions that discuss innovations and various changes in biological engineering, agricultural machinery and mechanization, harvest and post-harvest technologies, food engineering, energy engineering and water engineering that are incorporating sustainability are invited. Other related topics, including those chapters that cover challenges and future outlook in this area will also be included.

#### SECTION F: Nanotechnology and Sustainable Engineering

Chapters in this section would be those that discuss nanotechnology, trends in nanotechnology and how they affect specific aspects of engineering sustainability. It will also include those contributions that discussed end-of-life management of nanotechnology-based engineering products and systems. Other topics that highlights the challenges and the future of nanotechnology and sustainable engineering are also invited.

#### SECTION G: Facilities and Infrastructural Aspects of Sustainable Engineering

This section would contain chapters that discussed experiential/real-world impacts of available facilities and infrastructure on efforts made to incorporate sustainability into engineered systems. It will also contain chapters that are case studies on how engineering products and systems for sustainability would affect future availability of facilities and infrastructure for other aspects of societal needs/sectors of the economy. Contributions on scenarios analyses on the challenges and future prospects of sustainable engineering-based facility and infrastructure development are also welcome.

#### SECTION H: Socio-economic Aspects of Sustainable Engineering

This section will focus on topics that discuss how socio-economic factors affect various engineering decisions and how conventional engineering processes can be/are being improved by incorporating social, economic and cultural considerations in the sustainability concepts. Case studies sharing steps taken and results are highly encouraged in this section. Contributions that highlights challenges in making changes/marrying socio-economic and sustainability decisions in engineering processes and systems as well as the future outlook in this area are also welcome.

### SECTION I: Political and Institutional Aspects of Sustainable Engineering

This section would cover chapters that discuss how politics, policies and institutional culture/bureaucracy are affecting transitioning from conventional to sustainable engineering. It also welcome chapters on empirical studies and models of socio-political institutional systems that (would) promote engineering of products and systems in a sustainable manner. This section also covers chapters on laws and regulations as well as how they are developed (whether top-down, bottom-up, or other ways) on their effectiveness in fostering transitioning from unsustainable engineering to sustainable engineering. Contributions that discuss challenges in effecting changes and future outlook in this area are also encouraged.

### SECTION J: Educational Aspects of Sustainable Engineering

Chapters included in this section will be those that discussed engineering curriculum development, training and education administration that equip future engineers, planners, builders, managers and other professionals with skills required to incorporate sustainability concepts in their profession. It will also include case studies chapters on sustainability-based general education and sustainability-based continuing education. Chapters that discuss other educational aspects of sustainable engineering, sustainable engineering education challenges and future prospects of sustainable engineering education are also invited.

### SECTION K: Fourth Industrial Revolution and Other Aspects of Sustainable Engineering

This section will consist of chapters on the fourth industrial revolution and its impacts on environmental, social and economic sustainability. It will also include chapters that discuss how the consideration of social well-being, economic factors and environmental issues are affecting the development and deployment of the fourth industrial revolution spectrum in developed and developing economy as well as in various sectors of the economy (such as in manufacturing, healthcare, transportation/distribution, and other services). Topics that discuss challenges and future prospects would also be included.

Prospective authors are also encouraged to submit other topics that border on engineering for sustainability or are affected by sustainability in engineering but doesn't fit into any of the listed 11 sections above. Section suggestions for such topics are welcome.

Emails for abstracts and chapters' submission:

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## **Timeline for the Edited Book Publication**

The planned timeline for the edited book publication milestones is as shown below.

### ***1. Book Chapters' Abstract Review - 25 August 2022***

Reviews of all submitted abstracts will commence immediately after the 25 August 2022 deadline. The review is (i) to determine if the proposed chapter aligns with the general objectives of the book, and (ii) to assess the suitability of the proposed book chapter for the authors' chosen section, and if not, (iii) editors would attempt to find out if the chapter is suitable for inclusion in any other section.

Depending on the number of abstracts received and how fast we are able to get back reviewers' reports, authors should expect to receive feedback between 2 - 3 weeks after the abstract deadline. In case we didn't receive the expected number of abstracts at the 25 August deadline (which we don't expect) or there is a significant number of requests for extension, an additional 2 weeks extension could be given.

### ***2. Invitation to submit full manuscripts - 15 November 2022***

Invitation of authors of accepted abstracts to prepare full manuscripts of their chapters, with some recommendations where necessary. The deadline for this stage is scheduled to be on 15 November 2022. The plan is to give authors 6 - 8 weeks to develop and submit the full manuscripts.

Submitted manuscripts will undergo a blind peer-review process. Submitted manuscripts will be subjected to plagiarism check and the similarity index should be between 10% and 15%. Comments from the reviewers will be communicated to the authors as soon as they are received. Contributed chapters will be accepted at the recommendation of 2 reviewers. Full manuscripts will be sent out to reviewers as soon as they are received.

### ***3. Full chapters acceptance, update/corrections' request or manuscript rejection - 28 February 2023***

Authors will be notified of their full chapter's acceptance, request for update/corrections or rejection from 3rd week in January 2023 - end of February 2023. Authors that need to do corrections or improve their chapters will have 2 - 4 weeks to do it.

### ***4. Editorial review, correction and other related activities - 31 March 2023***

Necessary editorial review, correction and other related activities is expected to be completed by the end of March 2023. The edited package will be forwarded to the Springer Nature Publisher by April 2023.

### ***5. Book Publication - May/June 2023***

The online version of the book is expected in May/June 2023. This will be decided in conjunction with the publisher. Proofs of the book chapters will be sent by the publisher to the authors by the

Springer production team. All authors will be notified once the book is available online. The hardcopy is expected to be available about the same time.

Please visit this page shown below regularly for updates

<https://docs.google.com/document/d/1oroZ72s64GgdZgSMIez1Hd5nw9Awyd1bUCg9vezzbhc/edit?usp=sharing>

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### **References**

Dunmade, I.S. (2016). *Sustainable Engineering: A Vital Approach to Innovative Product Development and Community Capacity Building*. The 5<sup>th</sup> Inaugural Lecture of Covenant University, Ota, Ogun State Vol 5 No. 1 presented on 19 February 2016, 40 pages. Available online on 25 May 2020 at

<http://eprints.covenantuniversity.edu.ng/9496/1/7th%20Inaugural%20Lecture.pdf>

Rosen, M.A. (2012). Engineering Sustainability: A Technical Approach to Sustainability. *Sustainability* 4, 2270-2292; doi:10.3390/su4092270

Sustainable Engineering & Design, LLC (2016). Accessed online on 2 February 2016 at <http://www.sustainableengineeringdesign.com/>

Thorn, B.K., Brownell, S., and Carrano, A.L. (2011). "Development and Delivery of 'Engineering for the Developing World'. *In the Proceedings of the International Conference of Education, Research, and Innovation. November 16, 2011. Madrid, Spain*