

Carleton University
Department of Mechanical and Aerospace Engineering

Graduate Seminar Series

Wednesday September 16th, 2020, 8:00 - 10:00 PM EDT (Ottawa Time)

<https://www.eventbrite.ca/e/brian-ives-lecture-dr-hani-henein-additive-manufacturing-tickets-119328036369?utm-medium=discovery&utm-campaign=social&utm-content=attendeeshare&utm-source=strongmail&utm-term=listing>

Part of ASM Canada Council's Brian Ives Lectureship Series featuring Dr. Hani Henein of the University of Alberta

Additive Manufacturing

Professor Hani Henein

University of Alberta, Faculty of Engineering - Chemical and Materials Engineering Dept

Abstract

Additive manufacturing (AM), or 3D printing, is a new manufacturing approach where three-dimensional components are built layer by layer forming a complex 3D part. This approach deviates significantly from traditional manufacturing methods. Typically, components are designed and cast followed by a combination of heat treatment and hot or cold working. The process is completed with appropriate machining, now termed subtractive manufacturing. In AM, as applied to metals and engineered polymers, various forms of raw materials are used whether wire or powder. AM can provide industry numerous advantages to current processing approaches. These include the ability to make or repair parts in remote locations, freedom in design and the ability to adapt complex geometries to manufacturing. AM lends itself to small production lots and 'just-in-time' delivery. There are potential savings in inventory and in developing designs where multiple parts are integrated, re-designed and manufactured into one component. In this instance, transportation costs between vendors are eliminated and the performance of the component customised for its specific application. It proves to be disruptive to the current supply chain process of procuring goods. With the support of industry, a close collaboration has been formed between researchers at the University of Alberta and InnoTech Alberta in developing AM capabilities, training of qualified personnel and a knowledge base of AM relevant for industry. In this presentation, these capabilities and partnerships will be described, as well as contributions being made to AM for the resource sector.

Bio

After completing the MEng (thesis) at McGill University (1975) and a PhD at UBC (1981), Hani took up a faculty appointment at Carnegie-Mellon University, Pittsburgh, PA. In 1989, he moved to the University of Alberta actively teaching and doing research on pipeline steels, metal-matrix composites and rapid solidification. He partners with industry in research and has extensive international collaborations. His research is well recognized for a number of seminal contributions in nearly 170 refereed papers, books and book chapters. Hani formulated an international work abroad program for undergraduates in several high-quality engineering programs in Europe and Japan, placing over 100 students since 2002. He formulated in 2011 a Dual Degree Program with the Université de Lorraine. Amongst the distinctions he has received are five best paper awards, the prestigious Killam Research Fellowship, the Metals Chemistry Award and the MetSoc Award for Research Excellence. He has been inducted Fellow of ASM International, CIM and the Canadian Academy of Engineers. In service, Hani plays a leadership role in the profession as the 1998 MetSoc President, Past Editor of CMQ, the 2014 President of the Minerals, Metals and Materials Society (TMS) and presently the President of the American Institute of Mining, Metallurgical and Petroleum Engineers.