

Dr. Hugh McManus

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Hugh McManus is a Senior Special Projects Engineer at Metis Design, applying modern product development, business and technical practices to the aerospace industry. He has done pioneering work in application of lean techniques to product development with MIT's Lean Advancement Initiative (LAI). McManus facilitates lean short courses and transformation events using a unique business simulation (co-developed with Eric Rebentisch of LAI) to rapidly teach advanced lean concepts, and allow participants to experience lean transformations in a simulated environment.

Dr. McManus develops advanced tools for complex system architecture and design, in collaboration with the SEArI (formerly SSPARC) group in MIT's Engineering Systems Division. Tools and conceptual frameworks were developed for dealing with the uncertainties and opportunities of the very early stages of the design of complex systems. These include the Multi-Attribute Tradespace Exploration (MATE) method for understanding the trades between user desires, technical possibilities, and cost constraints. Hugh co-created a short-course on these topics, including a textbook and spreadsheet tools.

Dr. McManus has co-authored a book on lean methods in the Aerospace Industry, *Lean Enterprise Value*, and published tools such as the LAI tools "Product Development Value Stream Mapping (PDVSM) Manual" and an extensive report on new Space System Architecture methods. He has also co-edited a book on applications of polymer composite materials, has been an associate editor of the *AIAA Journal of Spacecraft and Rockets*, and has published over 60 peer-reviewed journal and conference publications.

Dr. McManus has also taught and practiced aerospace structures and materials. He was a structural engineer at Lockheed Missiles and Space Company, and at Kaman Aerospace for a total of 10 years, and taught structures and materials courses at MIT for 7 years. He remains actively interested in aerospace structural engineering, composite materials, and the durability of polymer materials, particularly under complex or challenging environments.

Dr. McManus received a Ph.D. in Mechanical Engineering from Stanford University in 1990, and S. B. and S. M. degrees in Aeronautics and Astronautics from MIT in 1980 and 1981. He has worked at Kaman Aerospace (1981-84) and Lockheed Missiles and Space Company (1984-1990), as the MIT Aeronautics and Astronautics Boeing Career Development Professor for 1991-94, the Class of 1943 Career Development Professor for 1994-97, Associate Professor for 1997-98, and as a Principal Research Engineer from 1998-2002. He is an Associate Fellow of the American Institute of Aeronautics and Astronautics.

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