# How to Integrate Ergonomics into the Engineering Design Process

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In this one-day workshop, participants will learn about how human factors/ergonomics can be effectively integrated into the engineering design process to improve not only worker health, but business performance. Participants will learn about HF and the industrialization process and various production design issues and strategies. They will also learn how to link HF to corporate strategies to gain support from senior management for HF. Ergonomists will be challenged to think about gaps in their understanding of engineering design language, tools and techniques and strategize to find ways to gain this information in order to work more effectively on a team with engineers. Common business improvement strategies such as "Lean" and "Six Sigma" will be discussed highlighting ways that HF can enhance these strategies. Several engineering design tools that have been adapted for HF will be presented (such as the failure mode effects analysis, and design for assembly). Participants will learn ways to work with engineering groups to adapt other engineering design tools and techniques to include HF.

*Judy Village is an Adjunct Professor in the School of Population and Public Health at the University of British Columbia and a Certified Professional Ergonomist in Canada and the US. She has more than 25 years of experience conducting research, consulting and teaching in musculoskeletal injury prevention. She earned her Ph.D. in the Department of Mechanical and Industrial Engineering at Ryerson University. The goal of her research, working with a large electronics company, was to work with engineers and human factors specialists to find ways to integrate human factors into design of their assembly production systems. Her publication in the Ergonomics Journal describing the three-year action research collaboration recently won the 2015 Liberty Mutual Award for the paper most advancing the field of ergonomics.*

*Patrick Neumann is an Professor in the Department of Mechanical and Industrial Engineering of Ryerson University. He holds a limited engineering license in Ontario, the European Ergonomist designation and a doctoral degree in design science from Lund University in Sweden. His research focuses on integrating human factors into the design and management of operations for sustainable competitive advantage through improvements in productivity, quality and employee competence development.*

**Goal of Workshop**

To help Ergonomists/Human Factors Specialists with integrating their knowledge into engineering design processes, and adapting tools and techniques to assist with this, to proactively prevent negative occupational health and performance outcomes.

**Target Audience**

Ergonomists, Human Factors Specialists, Engineers, Human Resources Personnel, Health and Safety Personnel

**Workshop Level**

Intermediate-Advanced

**Duration**

Full day

**Workshop Objectives**

At the end of this workshop, participants will be able to:

- Explain why ergonomics is typically left out of the engineering design process
- Describe typical design processes for how work is organized
- Describe ways to integrate ergonomics into the engineering design process based on the design for human factors (HF) theory
- Explain key principles of lean manufacturing and how HF can be integrated into lean
- Use tools to navigate the corporate strategy (cognitive mapping) and the design process (process mapping)
- Show how other engineering tools can be adapted to include ergonomics (such as failure mode effects analysis, and design for assembly)
- Provide ergonomic design guidelines and other information to engineers in a format that is most effective for their use