

Six Sigma Innovation & Design

Teaching hours: 2nd July – 22nd July from 9.00 – 13.00

(A) BOOK:

The Lean Six Sigma Black Belt Handbook: Tools and Methods for Process Acceleration
Frank Voehl, H. James Harrington, Chuck Mignosa and Rich Charron
CRC Press (Taylor & Francis Group). 2014. ISBN: 978-1-4665-5468-9

(B) FREE BOOK:

Lean Six Sigma: Research and Practice BookBoon.Com (2011)
Jiju Antony and Maneesh Kumar ISBN: 978-87-7681-768-8

ARTICLES:

(1) Toyota Production System Basic Handbook

Art of Lean, Inc. www.artoflean.com

(2) Lean Six Sigma, Creativity, and Innovation

International Journal of Lean Six Sigma, Vol. 1, No. 1, pp. 30-38.
Roger Hoerl and Martha Gardner

(3) Six Sigma Innovation and Design

In J. Wang (Ed.) *Encyclopedia of Business Analytics & Optimization*
Volume 4, pp. 488-499, Spring 2014. Rick Edgeman

(4) Six Sigma: Definition and Underlying Theory

Journal of Operations Management, Vol. 26, pp. 536-554.
Roger Schroeder, Kevin Linderman, Charles Liedtke, and Adrian Choo

(5) How to Make Product Development Projects more Successful by Integrating Kano's Model of Customer Satisfaction into Quality Function Deployment

Technovation, Vol. 18, No. 1, pp. 25-38 (1998) K. Matzler and H. Hinterhuber

(6) An Analysis of the Six Sigma DMAIC Method from the Perspective of Problem Solving

International Journal of Production Economics, Vol. 139, No. 2, pp. 604-614. (2012)
Jeroen de Mast and J. Lokkerbol

(7) The Science in Six Sigma

Quality Progress, January 2007, Vol. 40, No. 1, pp. 25-27. J. de Mast and Søren Bisgaard

(8) Similarities and Differences Between TQM, Six Sigma and Lean

The TQM Magazine, Vol. 18, No. 3, pp. 282-296
Roy Andersson, Henrik Eriksson and Håkan Torstensson

(9) Six Triumphs and Six Tragedies of Six Sigma

Quality Engineering, Vol. 22, No. 4, pp. 299-305. (2010) T. N. Goh

(10) Does Six Sigma Improve Performance

Quality Management Journal, Vol. 18, No. 4, pp. 7-20. S. Thomas Foster

(11) After Six Sigma – What’s Next?

Quality Progress, January 2006, Vol. 39, No. 1, pp. 30-36. J. de Mast and Søren Bisgaard

(12) Quality Quandries: Design for Six Sigma: Method and Application

Quality Engineering, Vol. 23, No. 2, pp. 204-211 (2011).

J. de Mast, G. Diepstraten and R. Does

COURSE READING SCHEDULE:

Pre-Reading: Article (1)

Book A: Chapters 1, 2, 3

Book B: Chapters 1, 2

Statistics Review PowerPoint Files: Probability, Hypothesis Testing, χ^2

2-4 July: Articles (2), (3), (4)

Book A: Chapters 4, 5

Book B: Chapters 4, 5

5-6 July: Articles (5), (6), (7)

Book A: Chapters 6, 7

7-11 July: Articles (8), (9), (10)

Book A: Chapters 8, 9

13-14 July: Articles (11), (12)

Book A: Chapter 10

COURSE MATERIAL SCHEDULE:

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NOTES: Between 30 minutes and 60 minutes per day will be reserved for team activities. More time will be provide for team activities on selected days.

These times will be related to team projects that will be presented on Monday 21 July and Tuesday 22 July, 2014. Project reports will be due to Professor Edgeman in electronic format not later 6pm on Friday, 18 July.

POWERPOINT FILES FOR EACH OF THE BELOW TOPICS WILL BE AVAILABLE TO COURSE PARTICIPANTS

- 2-4 July:** Brief Introduction to Six Sigma
History and Overview
Customer Focus & Culture
Toyota Production System and the House of Lean
Value Stream Mapping
- 7-11 July:** Failure Modes & Effects Analysis – Measurement Systems Analysis
Analysis Phase
Projects: Charters, Scoping and Management
Quantitative & Graphical Analysis
Quality Management & Planning Tools
Benchmarking
Change Management Overview
- The Improve Phase
Customer Needs, Quality Dimensions, and Quality Function Deployment
Theory of Inventive Problem Solving (TRIZ)
Concept Generation & Selection
The Control Phase
- 14-18 July:** Statistical Process Control
Reliability & Safety Analysis
Regression Modeling
Principles of Experimental Design and 2^K Designs
Screening Designs
Central Composite Designs & Second Order Designs
- 21 – 22 July** Presentations