IEE 581 Six Sigma Methodology – Fall 2013

Mon-Wed, 6:00pm-7:15pm, BYAC 210

Course Description: The six sigma process improvement strategy of define, measure, analyze, improve, and control (DMAIC). Integrates and deploys statistical methods and other six sigma problem solving via the DMAIC framework. Requires background in design of experiments, statistical quality control, and regression analysis.

Prerequisites: Must have completed IEE 570, IEE 572, and IEE 578; or have completed two of the three courses and be concurrently enrolled in the third course.

Date	Weekday	Class	Topic	Instructor	Text Reading
8/22/13	**THU**	-	**Classes Start**		
8/26/13	MON	1	1st Day of Class: Introduction to Six Sigma, Course Overview, The DMAIC Process	Jennings	S&H: Ch 1,2,3; Mikel Harry video
8/28/13	WED	2	Define-1, including project selection and management, project failure modes	Sandell/Rajavelu	S&H: Ch 4,5; G: Ch 8
9/2/13	**MON**	-	**Labor Day Holiday Observed - University Closed**		
9/4/13	WED	3	Define-2, including project selection and management, cost of quality	Sandell/Rajavelu	
9/9/13	MON	4	Measure-1	Shah	
9/11/13	WED	5	Measure-2	Shah	
9/16/13	MON	6	Analyze-1: Basic Tools, Non-Parametric & Categorical Methods	Jennings	
9/18/13	WED	7	Analyze-2: Basic Tools, Non-Parametric & Categorical Methods	Jennings	
9/23/13	MON	8	Improve-1, including project planning	Zenzen	G: Ch 10,11
9/25/13	WED	9	Improve-2	Zenzen	
9/30/13	MON	10	Computer Experiments; Assignment #1 Due	Montgomery	
10/2/13	WED	11	Analyze-3: Basic Tools, Non-Parametric & Categorical Methods	Jennings	
10/7/13	MON	12	Control-1: Process Institutionalization	Jennings	S&H: Ch 6,7; G: Ch 12
10/9/13	WED	13	Control-2: Replication & Standardization	Jennings	
10/14/13	**MON**	-	**Fall Break – Classes Excused**		
10/16/13	WED	14	Mid-term Exam		
10/21/13	MON	15	Teams-1: Fundamentals, dynamics, ...	Lawson	S&H: Ch 8; G: Ch 2,9
10/23/13	WED	16	Teams-2: ..., leadership, facilitation	Lawson	
10/28/13	MON	17	Making Presentations to Non-Statisticians; Assignment #2 Due	Lawson	
10/30/13	WED	18	Design for Six Sigma	Holcomb	G: Ch 15
11/4/13	MON	19	Lean Overview	Holcomb	G: Ch 1,3,4,13,14
11/6/13	WED	20	DFSS: Design Project Management-1	Holcomb	
11/11/13	**MON**	-	**Veteran's Day Observed - University Closed**		
11/13/13	WED	21	DFSS: Design Project Management-2	Holcomb	
11/18/13	MON	22	Six Sigma in Service & Transactional Businesses	Sandell/Rajavelu	
11/20/13	WED	23	Lean in Service and Transactional Businesses	Sandell/Rajavelu	
11/25/13	MON	24	DFSS in Service and Transactional Businesses	Jennings	
11/27/13	WED	25	CI/LSS/SS Deployments	Custer	S&H: Q&A, App; G: 5,6,7
11/28/13	**THU/FRI**	-	**Thanksgiving Observed - University Closed**		
12/2/13	MON	26	Six Sigma in Health Care; Assignment #3 Due	Goebel-Rush	
12/4/13	WED	27	Last Day of Classes / Review Day	Jennings	
12/6/13	**FRI**	-	**Classes End**		
12/9/13	**MON**	-	**Final Exam at 4:50 - 6:40 PM**		

Class Grading

Mid-Term Exam	80
Assignment #1	20
Assignment #2	20
Assignment #3	20
Final Exam	80

Final class grade will be based on the percentage of total points received.

To benefit from the class format as well as show respect for guest lecturers, class attendance and participation are necessary. To encourage attendance, a surprise quiz may be given at the end of a lecture.

- If you are present and your answer is correct, 1 percentage point will be added to your final grade
- If you are present and your answer is incorrect, 0 points will be added
- If you are not present and you did not inform me before class, 1 percentage point will be subtracted from your final grade
- If you are not present and you did inform me before class, 0 points will be added

Textbooks

George, M.L. (2002). *Lean Six Sigma: Combining Six Sigma Quality with Lean Production Speed*. McGraw-Hill, New York, NY.

Snee, R.D. and Hoerl, R.W. (2003). *Leading Six Sigma: A Step-by-Step Guide Based on Experience with GE and Other Six Sigma Companies*. Financial Times Prentice Hall, Upper Saddle River, NJ. This book is no longer published in hardback. It is now published in paperback under ISBN 978-0-13-611742-1.

ASU Student Academic Integrity Policy

Ensure that you are familiar with ASU's Student Academic Integrity Policy. Information can be found at asu.edu and at this link: https://provost.asu.edu/index.php?q=academicintegrity Violations will be managed in accordance with the policy.

Resource List

Books

George, M.L., Maxey, J., Rowlands, D. and Price, M. (2005). *The Lean Six Sigma Pocket Toolbook*. McGraw-Hill, New York, NY.

Hoerl, R.W. and Snee, R.D. (2002). *Statistical Thinking: Improving Business Performance*. Duxbury, Pacific Grove, CA.

Perry, R.C. and Bacon, D.W. (2007). *Commercializing Great Products with Design for Six Sigma*. Pearson Prentice-Hall, Upper Saddle River, NJ.

Pyzdek, T. (1999). *The Complete Guide to Six Sigma*. QA Publishing LLC, Tucson, AZ.

Pyzdek, T. (2003). *The Six Sigma Project Planner: A Step-by-Step Guide to Leading a Six Sigma Project Through DMAIC*. McGraw-Hill, New York, NY.

Snee, R.D. and Hoerl, R.L. (2005). *Six Sigma Beyond the Factory Floor*. Pearson Prentice Hall, Upper Saddle River, NJ.

Articles

Anderson-Cook, C. M., Editor (2005). Special Issue, "New Directions for Six Sigma in the New Millennium", *Quality and Reliability Engineering International*, Vol. 21, No. 3, April. This issue contain several useful articles on various aspects of six sigma methodology and practice. It may be found at the journal website, www.interscience.wiley.com.

Brady, J.E. and Allen, T.T. (2006). "Six Sigma Literature: A Review and Agenda for Future Research". *Quality and Reliability Engineering International* 22, pp. 335-337.

Hahn, G.J., Doganaksoy, N., and Hoerl, R. (2000). "The Evolution of Six Sigma". *Quality Engineering* 12(3), pp. 317-326.

Hatchuel, A., and Weil, B. (2009) "C-K design theory: an advanced formulation" *Research in Engineering Design*, Vol. 19, pp.181–192.

Hoerl, R.W. (2001). "Six Sigma Black Belts: What Do They Need to Know? (with discussions and response)". *Journal of Quality Technology* 33(4), pp. 391-435. (This article is free to the general public on the journal's site: http://www.asq.org/pub/jqt/past/vol33_issue4/)

Montgomery, D.C. (2010), "A Modern Framework for Achieving Enterprise Excellence", *International Journal of Lean Six Sigma*, Vol. 1, No. 1, pp. 56-65.

Montgomery, D. C. and Woodall, W.H. (2008), "An Overview of Six Sigma", *International Statistical Review*, Vol. 76, No. 3, pp. 329–346.

Sobek, D. K., Ward A.C., and Liker J. K. (1999) "Toyota's Principles of Set-Based Concurrent Engineering", *Sloan Management Review*, Vol. 40, Issue 2 pp. 67-83.

Steinberg, D.M., Bisgaard, S., Doganaksoy, N., Fisher, N., Gunter, B., Hahn, G., Keller-McNulty, S., Kettenring, J., Meeker, W.G., Montgomery, D.C., and Wu, C.F.J. (2008), "The Future of Industrial Statistics: A Panel Discussion", *Technometrics*, Vol. 50, No. 2, pp. 127.

Web Sites

Transactional TRIZ: http://transactionaltriz.com/

American Society for Quality, ASQ: http://asq.org , consider registering to be able to access "open-access articles" like the one listed above