

课程详述

COURSE SPECIFICATION

以下课程信息可能根据实际授课需要或在课程检讨之后产生变动。如对课程有任何疑问，请联系授课教师。

The course information as follows may be subject to change, either during the session because of unforeseen circumstances, or following review of the course at the end of the session. Queries about the course should be directed to the course instructor.

1. 课程名称 Course Title	精益六西格玛设计 Design for Lean and Six Sigma				
2. 授课院系 Originating Department	力学与航空航天工程系 Department of Mechanics and Aerospace Engineering				
3. 课程编号 Course Code	MAES001				
4. 课程学分 Credit Value	2				
5. 课程类别 Course Type	通识选修课程 General Education (GE) Elective Courses				
6. 授课学期 Semester	春季 Spring / 夏季 Summer / 秋季 Fall				
7. 授课语言 Teaching Language	英文 English				
8. 授课教师、所属学系、联系方式 (如属团队授课, 请列明其他授课教师) Instructor(s), Affiliation & Contact (For team teaching, please list all instructors)	韩品连, 力学与航空航天工程系, 88018165, hanpl@sustc.edu.cn Pinlian Han, Department of Mechanics and Aerospace Engineering, 88018165, hanpl@sustech.edu.cn				
9. 实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	无 NA				
10. 选课人数限额(可不填) Maximum Enrolment (Optional)					
11. 授课方式 Delivery Method	讲授 Lectures	习题/辅导/讨论 Tutorials	实验/实习 Lab/Practical	其它(请具体注明) Other (Please specify)	总学时 Total
学时数 Credit Hours	16		32		48

12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	NA
13. 后续课程、其它学习规划 Courses for which this course is a pre-requisite	NA
14. 其它要求修读本课程的学系 Cross-listing Dept.	NA

教学大纲及教学日历 SYLLABUS

15. 教学目标 **Course Objectives**

The aims of this Course are:

1. The Lean Thinking

- Describe the elements of a process
- Draw a process map
- Explain what constitutes value in a process
- List the five fundamental lean principles
- Describe several concepts and tools for implementing lean principles

2. People: The heart of Lean

- Explain why people are the key to improving productivity
- Realize that effective communication, shared goals and knowledge, and mutual respect lead to improved organizational performance
- Participate as a member of a team to achieve a positive outcome

3. A3 Thinking

- Recognize that A3 is not just a tool but a way of thinking
- Use the A3 chart as a standard tool for implementing lean projects

4. Quality Tool and Topics

- Describe how quality is essential in achieving customer satisfaction
- Use basic quality tools

5. Six Sigma Basics

- Recognize that Six Sigma is a valuable approach to improve process quality
- Interpret a basic Statistical Process Control chart
- Distinguish process from specified control limits
- Describe a capable process

16. 预达学习成果 Learning Outcomes

By the end of this Course students should have gained:

Knowledge of Lean and Six Sigma

Intellectual Skills to think and act to improve the daily process

Professional Practice Skills to use tools for analyzing the process and reduce wastes

Transferable Skills to help company or organization to Lean

17. 课程内容及教学日历（如授课语言以英文为主，则课程内容介绍可以用英文；如团队教学或模块教学，教学日历须注明主讲人）

Course Contents (in Parts/Chapters/Sections/Weeks. Please notify name of instructor for course section(s), if this is a team teaching or module course.)

学时数 Credit Hours	序号 No.	
2	1	
	2	
	3	
	4	
	5	
2	6	
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	37	
2	38	

32 学时实践课
32 Practical

学时 Credit Hours	序号 No.	内容 Content
2	1	实践项目介绍 Introduction of the real world project
	2	组建团队及成员分工 Team building
2	3	企业参观（生产、服务） Company plant tour
	4	问卷调查，数据收集 Questionnaire, collecting data



2	5	资料检索 Data Retrieval (papers and books)
	6	企业现阶段生产或服务流程图 Drawing production or service process map
2	7	资料检索 Data Retrieval (papers and books)
	8	画流程图 Drawing process map
2	9	组员讨论 Group meeting
	10	优化流程 Optimizing process
	11	提出建议 Suggestions
2	12	优化方案报告 Optimizing plan reports
	13	与企业代表讨论 Discussing with the representatives of the company
	14	确定优选方案, 团队整合 Making decision, team integration
2	15	优选方案试运行 Testing the optimum plan
	16	收集数据 Collecting data
2	17	优选方案试运行 Testing the optimum plan
	18	收集数据 Collecting data
2	19	分析 Analysis
2	20	分析 Analysis
2	21	讨论并优化设计 Discussing and redesigning
2	22	优化方案报告

		New plan report
	23	与企业代表讨论 Discussing with the representatives of the company.
	24	确定优选方案 Making decision
2	25	试运行更新方案 Retesting the renewed plan
	26	收集数据 Collecting data
2	27	试运行更新方案 Retesting the renewed plan
	28	收集数据 Collecting data
2	29	撰写终期报告 Writing final report
2	30	终期验证报告 Final verification report

18. 教材及其它参考资料 Textbook and Supplementary Readings

1. The Lean Thinking

Womack, J. and Jones, D., Lean Thinking, 2nd Edition, Simon & Shuster, New York, 2003

Graban, Mark, Lean Hospitals, 2nd Ed, CRC Press, New York, 2012

Rother, M. and Shook, J. Learning to See, v1.2, The Lean Enterprise Institute, Cambridge, MA June 1999

Liker, Jeffery, The Toyota Way, McGraw-Hill, New York, 2004

Murman, E., Allen, T., Bozdogan, K., Cutcher-Gershenfeld, J., McManus, H., Nightingale, D., Rebentisch, E., Shields, T., Stahl, F., Walton, M., Warmkessel, J., Weiss, S., and Widnall, S., Lean Enterprise Value: Insights from MIT Lean Aerospace Initiative, Palgrave, New York, 2002

“For Athletic Shoe Company, the Soul of Lean Management Is Problem Solving”, Lean Enterprise Institute, June 24, 2008

2. People: The heart of Lean

Cutcher-Gershenfeld, J., et. al., Knowledge Driven Work, Oxford University Press, New York, 1998

Fischer, R. and Urey, W., Getting to Yes: Negotiating Agreement Without Giving In, 2 nd Ed, Penguin Books, New York, 1991

Gittell, J.H., The Southwest Airlines Way, McGraw Hill, New York, 2003

Gittell, J.H., High Performance Healthcare, McGraw Hill, New York, 2009

McGregor, D., The Human Side of Enterprise, Updated with commentary by Joel Cutcher-Gershenfeld, McGraw Hill, New York 2006

Senge, P., The Fifth Discipline, Doubleday, New York, 1990

Whyte, D., The Heart Aroused – Poetry and the Preservation of the Soul in Corporate America, Doubleday, 1994

3. A3 Thinking

Jimmerson, Cindy. A3 Problem Solving for Healthcare: A Practical Method for Eliminating Waste. Productivity Press, Boca Raton, FL. 2007

Shook, John, Managing to Learn: Using the A3 management process to solve problems, gain agreement, mentor, and lead, Lean Enterprise Institute, Cambridge, MA 2008

Sobek, D. K., Smalley, A. Understanding A3 Thinking: A Critical Component of Toyota's PDCA Management System, Productivity Press, Boca Raton, FL. 2008

4. Quality Tool and Topics

Deming, E., Out of Crisis, The MIT Press, Cambridge, MA, 2000

Hopp, W.J. and Spearman, M.L., Factory Physics, 3rd Edition, McGraw-Hill/Irwin, 2007

Juran, J.M., Juran on Quality by Design, The Free Press, New York, 1992

Nelson, E.C., Batalden, P.B., Godfrey, M. M., Quality By Design: A Clinical Microsystems Approach, John Wiley and Sons, New York, 2007

Ritzman, L.P. and Krajewski, L.J., Foundations of Operations Management, Prentice Hall, Upper Saddle Brook NJ, 2003

Tague, N.R., The Quality Tool Box, Second Edition, ASQ Quality Press, 2004

5. Six Sigma Basics

Bertels, T. Ed, Rath & Strong's Six Sigma Leadership Handbook, John Wiley & Sons, 2003.

Bothe, D.R., Measuring Process Capability, 1997

Gitlow, H.S. and Levine, D.M., Six Sigma for Green Belts and Champions, Foundations, DMAIC, Tools, Cases, and Certification, Prentice Hall (Pearson Education, Inc.) 2005

Harry, M. and Schroeder, R., Six Sigma, Currency Doubleday, New York, 2000

Henderson, G.R., Six Sigma Quality Improvement with Minitab, John Wiley & Sons, 2006.

Ledolter, J. and Burrill, C.W., Statistical Quality Control, Strategies and Tools for Continual Improvement, John Wiley & Sons, Inc., 1999

课程评估 ASSESSMENT

19. 评估形式 Type of Assessment	评估时间 Time	占考试总成绩百分比 % of final score	违纪处罚 Penalty	备注 Notes
出勤 Attendance		25		
课堂表现 Class Performance		25		
小测验 Quiz				
课程项目 Projects		40		
平时作业 Assignments				
期中考试 Mid-Term Test				
期末考试 Final Exam				
期末报告 Final Presentation		10		
其它（可根据需要 改写以上评估方 式） Others (The above may be modified as necessary)				

20. 记分方式 **GRADING SYSTEM**

- A. 十三级等级制 **Letter Grading**
 B. 二级记分制（通过/不通过） **Pass/Fail Grading**

课程审批 REVIEW AND APPROVAL

21. 本课程设置已经过以下责任人/委员会审议通过
This Course has been approved by the following person or committee of authority

力学与航空航天工程系教学指导委员会
 The commission of teaching instruction in department of mechanics and aerospace engineering