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**	质量工程与管理 Quality Engineering and Management
2.	**授课院系** **Originating Department**	系统设计与智能制造学院 School of System Design and Intelligent Manufacturing
3.	**课程编号** **Course Code**	SDM321
4.	**课程学分 Credit Value**	2
5.	**课程类别** **Course Type**	专业基础课 Major Foundational Courses
6.	**授课学期** **Semester**	春季 Spring
7.	**授课语言** **Teaching Language**	中英双语 English & Chinese
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）**	薛珂，研究助理教授 系统设计与智能制造学院（设计智造学院） Xue Ke, Research Assistant Professor School of System Design and Intelligent Manufacturing(SDIM) Email: xuek@sustech.edu.cn
9.	**实验员/助教、所属学系、联系方式** **Tutor/TA(s), Contact**	待公布 To be announced
10.	**选课人数限额(可不填)** **Maximum Enrolment** **（Optional）**	待公布 To be announced

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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	0	32	0	48

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

教学大纲及教学日历 SYLLABUS

15. 教学目标 Course Objectives

本课程旨在揭示质量工程管理的基本理论、方法与应用。希望学生掌握质量工程的理论基础和质量管理的应用技术和方法。

This course aims to introduce the basic theories, methods and applications of quality engineering. The students are expected to master the theories of quality control and the applied technologies and methods of quality management.

16. 预达学习成果 Learning Outcomes

在学习完成时，学生将能够掌握质量工程管理的基本理论，方法和应用。 了解流行的质量工程管理的应用场景，以及处理实际问题的能力。

Upon completion of the course, students will be able to master basic theories, methods and applications of quality engineering management. understand the application scenarios of popular quality engineering management, and the ability to deal with practical problems.

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.)

第一周：导论
课程介绍
质量管理的基本概念
质量控制
质量成本
全面质量管理

第二周：质量理念和质量体系
质量理念和方法
质量体系的要素
供应商关系和管理方法
质量审计

第三周：计划、控制和确保产品和过程质量
产品和服务开发规划流程
材料控制
验收抽样
测量系统

第四周：质量管理实践和工具
质量管理实践
质量功能部署
持续质量改进工具
相关国际标准

第五周：质量改进的统计学基础
概率的相关概念
描述性统计
概率分布
推断统计

第六周：数据分析和抽样
抽样检验的基本原理
计数抽样检验
计量抽样检验

第七周：统计过程控制
变异原因
控制图的统计学基础
变量控制图
属性控制图

第八周：过程能力分析
规范限值和控制限值
规格和工艺能力
过程能力指数

第九周：期中考试（项目形式）

第十周：可靠性及风险管理
可靠性概念
可靠性系统设计
可靠性和可维护性
可靠性、安全性、危害评估工具

第十一周：实验设计和田口方法
实验设计基础
正交因子实验设计
田口方法
田口方法的实验设计

第十二周：问题解决和质量改进
解决质量问题的方法
管理和规划工具
纠正措施
预防行动

第十三周：六西格玛管理
六西格玛方法简介
DMAIC 过程控制
六西格玛项目管理
六西格玛设计

第十四周：质量管理体系
质量管理体系标准
国际质量管理体系的建立
质量管理体系的运行与改进

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第十五周：实用质量管理
质量管理的挑战
项目和计划的实际质量
如何将质量纳入新产品和/或流程

第十六周：总结和复习
[实验课] 复习、答疑及期末项目

Week 1: Introduction to Quality Control and Total Quality Systems
Course Introduction
Basic concepts of quality
Basic principles of quality control
Quality costs
Total quality management

Week 2: Quality Philosophies and Quality Systems
Quality philosophies and approaches
Elements of a quality system
Supplier relations and management methodologies
Quality audits

Week 3: Planning, Controlling, and Assuring Product and Process Quality
Process for planning product and service development
Material control
Acceptance sampling
Measurement systems

Week 4: Quality Management Practice and Tools
Management practices
Quality function deployment
Tools for continuous quality improvement
International standards

Week 5: Statistical Foundations of Quality Improvement
Concepts of probability
Descriptive statistics
Probability distributions
Inferential statistics

Week 6: Data Analyses and Sampling
Distribution plots
Analysis of count data
Concepts in sampling

Week 7: Statistical Process Control
Cause of variation
Statistical basis for control charts
Control charts for variables
Control charts for Attributes

Week 8: Process Capability Analysis
Specification limits and control limits
Specifications and process capability
Process capability indices

Week 9: Mid-term test
[Lab] Mid-term test

Week 10: Reliability and Risk Management
Concepts of reliability
Design of systems for reliability
Reliability and maintainability
Reliability, safety, hazard assessment tools

Week 11: Experimental Design and the Taguchi Method

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Fundamentals of experimental design
Factorial experiments
The Taguchi method
Experimental design in the Taguchi method

Week 12: Problem Solving and Quality Improvement
Approaches
Management and planning tools
Corrective action
Preventive action

Week 13: Six Sigma Management
Introduction to Six Sigma method
DMAIC process control
Six Sigma project management
Design for Six Sigma

Week 14: Quality Management System
Quality management system standards
Establishment of international quality management system
Operation and improvement of quality management system

Week 15: Practical Quality Management
Challenges for quality management
Practical quality for projects and programs
Incorporating quality into a new product and/or process

Week 16: Summary & Revision
[Lab] Final projects.

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

Textbook:

Fundamentals of Quality Control and Improvement, 3/e
Mitra, Amitava
©2012 | John Wiley & Sons | Paper; 687 pp | ISBN-13: 9781118491669

Quality Improvement: Pearson New International Edition, 9/e
Besterfield
©2014 | Pearson | Paper; 272 pp | ISBN-13: 9781292022307

Quality Management for Organizational Excellence Pearson New International Edition: Introduction to Total Quality, 7/e
Goetsch & Davis
©2013 | Pearson | Paper; 480 pp | ISBN-13: 9781292022338 -

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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					
课堂表现 Class Performance					
小测验 Quiz	1-16 周 Week 1-16		20	NIL	14 次 14 times
课程项目 Projects	期中项目	Week 9	30	NIL	期中项目

	Project report				Project I
平时作业 **Assignments**	1-16 周 Week 1-16		20	NIL	10 次 10 times
期中考试 **Mid-Term Test**					
期末考试 **Final Exam**					
期末报告 **Final Presentation**	1-16 周 Week 16		30	NIL	期末项目 Project II
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

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