

# Technical Elective: Quality Control and Six Sigma

Fall, 2021-2022

Class Room: Room **4-212** SCUPI Building

Class Hours: Monday 8:15-9:00 am, 9:10-9:55 am, 10:15-11:00 am

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**Instructor:** Kunpeng Wang

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Office Hours: Mon./Thur. 1:30-4:30 pm, Tues. 1:30-4:00 pm

Office: Room **3-317A** SCUPI Building

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**Teaching Assistant:** Haopeng Zhou

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Tutorials: TBA

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## Course Description

This course promotes understanding of the content and practice of quality management and Six Sigma. Topics revolve around quality management principles, qualitative and quantitative techniques for quality design, control and improvement as well as discussions about organizational quality, Baldrige and implementation. A brief review of the fundamentals of statistics and probability and their applications in quality management is provided, and various measurement and control techniques are presented.

## Prerequisites

IE 1070 Probability and Statistics for Engineers

IE 1071 Statistical Testing and Regression

## Course Objectives

This course introduces basic quality management concepts and definitions and builds on that knowledge to explore quality improvement techniques as a means to continually improve organizational quality and integrate quality into management. At the completion of this course, students are expected to

1. Explain the concepts of Total Quality Management and Six Sigma.
2. Diagnose problems in the quality improvement process.
3. Apply various quality improvement techniques.
4. Describe the basic tools and techniques of Kaizen and how it can be applied.
5. Apply the basic concepts of statistics and probability to quality management and control.
6. Improve real life problems with quality management techniques.

## Course Content

We will cover most of the material in Chapters 1-14 in the textbook.

## Class Structure

Lectures. We will have class activities and discussions in each class.

## Course Materials

**Textbook:** Managing for Quality and Performance Excellence, 10th Edition, CENGAGE Learning, by Evans and Lindsay.

## Blackboard

Please regularly log on and check <https://learn.scupi.cn/>. We will post lecture notes, assignments, projects, announcements and your grades on it.

## Course Assessment

Weekly assignments, case studies, class activities, projects, midterm and final exams.

## Schedule of Exams, Assignments and Projects

### Exams

Date	Time	Component
Oct 25, 2021 (2 hours in class)	8:15-10:15 am	Midterm
Final exam week (January 3 to January 7)	TBA	Final exam

### Class Activities

Students will be divided into groups from Week 01. Students will work in small groups of 4 students on each class activity.

### Assignments

- (a) You will be asked to complete homework assignments. They will be due by the following week on Monday at the beginning of the class at 8:15 am. Plagiarism will not be tolerated. However, discussions of assignment problems will be permitted. Please also note each student must submit his/her individual assignment.
- (b) In each course, students will be given case studies. A 500-word summary of the case study assigned for the week is required each week for each group. Case write-ups should at least address the assigned case questions and should not exceed 600 words. You can use the memorandum format posted on Blackboard. Certain groups will be chosen to present their case studies in the class.

### Projects

Students will work in groups on the final project. It is the responsibility of the groups to manage their own interactions and individual participation. The groups will make a professional-level presentation for the project during Weeks 16 and 17. Each student in a group will receive the same grade based on the assessment of the project written report and presentation.

Start	Due	Component
Nov 29, 2021	Dec 20, 2021	Final Project

## Grading Policy

The final grade be computed according to the following scheme:

**Scheme:** Total grade = 10% Assignments + 30 % Midterm Exam + 30 % Final Exam + 15 % Projects + 15 % Class Activities and Case Studies.

**Note:** All midterm and final exams will be closed-book.

## Conversion of Numerical Grades to Final Letter Grades Follows the SCUPI Common Grade

A [90,100]   A- [85,90)   B+ [80,85)   B [76,80)   B- [73,76)   C+ [70,73)   C [66,70)  
C- [63,66)   D+ [61,63)   D [60,61)   F (60,0)

## Schedule and weekly learning goals

The schedule is tentative and subject to change. The listed objects below should be viewed as the key concepts you should grasp after each week, and also as a study guide before each test and the final exam. The midterm exam covers Weeks 01-08, and the final exam will cover all topics taught in this semester.

### Week 01, 08/30-09/03

- Cover Chapter 1.
- Course Overview.
- Introduction to quality.

### Week 02, 09/06-09/10

- Cover Chapter 2.
- Foundations of quality management.

### Week 03, 09/13-09/18

- Cover Chapter 3.
- Customer focus.

### Week 04, 09/22-09/24

- Cover Chapter 4.

- Workforce focus.

**Week 05, 09/26-09/30**

- Cover Chapter 5.
- Process focus.

**Week 06, 10/08-10/09**

- National Day Holiday.

**Week 07, 10/11-10/15**

- Cover part of Chapter 6.
- Probability distributions.
- Statistical methodology.
- Statistical analysis with software.

**Week 08, 10/18-10/22**

- Cover Chapter 6.
- Statistical inference.

**Week 09, 10/25-10/29**

- **Midterm**

**Week 10, 11/01-11/05**

- Cover Chapter 7.
- Design for quality and product excellence.

**Week 11, 11/08-11/12**

- Cover part of Chapter 8.
- Measuring and controlling quality.
- Measurement.

**Week 12, 11/15-11/19**

- Cover Chapter 8.
- Statistical process control.
- Control charts.

**Week 13, 11/22-11/26**

- Cover Chapter 9.
- Process improvement and six sigma.

**Week 14, 11/29-12/03**

- Chapter 10.
- The Baldrige framework for performance excellence.

**Week 15, 12/06-12/10**

- Briefly introduce Chapters 11 & 12.
- Strategy and performance excellence.
- Measurement and knowledge management for performance excellence.

**Week 16, 12/13-12/17**

- Briefly introduce Chapters 13 & 14.
- Leadership for performance excellence.
- Building and sustaining quality and performance excellence.

**Week 17, 12/20-12/24**

- **Presentations.**

**Week 18, 12/27-12/31 Review session**

- **Presentations.**
- **Review Session.**

**Week 19, 01/03-01/07**

- **Final Exam Week.**

## **Course Policies**

**There will be no special treatments for any students in this course!** For example, if you have a heavy course load, you should expect a steep learning curve and be prepared for it. You will not be exempted from any assignments.

## During Class

I understand that the electronic recording of notes will be important for class and so computers will be allowed in class. Please refrain from using computers for anything but activities related to the class. Phones are prohibited as they are rarely useful for anything in the course. Eating and drinking are allowed in class but please refrain from it affecting the course. Try not to eat your lunch in class as the classes are typically active.

## Attendance Policy

Attendance is expected in all lectures. Valid excuses for absence will be accepted before class. In extenuating circumstances, valid excuses with proof will be accepted after class.

## Policies on Late Assignments and Exams

Students should start their homework assignments immediately after the assignments are given, and **DO NOT** wait until the last minute to meet the deadlines. **Late assignments will be NOT accepted except for emergencies and health issues. Any other late assignments handed in will be marked but will be given 0.** At most **Two** extensions for assignments will be given in this course. All assignments will be counted in your total grade. **Late submission for previous assignments during the final exam period will NOT be accepted in any form for any excuses.**

All tests and the final exam are mandatory. There will be absolutely no makeup exam for each test. If you miss the final, a makeup exam may be given for the final exam if the student has the approval from the instructor or emergencies and health issues **with a valid proof**. I will not accept the student deceleration for absence form for the final exam.

## Academic Integrity

At Sichuan University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do.

Everyone at SCUPI is expected to treat others with dignity and respect. The Code of Student Conduct allows Sichuan University to take disciplinary action if students don't follow this community expectation.