

MT 222 Quality Control Methods in Manufacturing - Syllabus Spring 2025

This is a web based syllabus and is best viewed/utilized on-line

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Course Description: Explores quality control methods used in semiconductor manufacturing, including statistical process control (SPC), control charts, performance representation and capability measurements. Emphasizes computer manipulation of actual data for analysis and design of quality.

Credits: 3

Text Book: Quality, 3rd 4th 5th or 6th Edition, Donna C. S. Summers. Let me know what edition you are using.

Prerequisites: MTH 243 Statistics I or MT 108 Statistics for Process Control, and WR 227 Technical/Professional Writing

Course Objectives: On completion of this course the student should be able to:

1. Understand the history and requirements for effective quality systems in modern manufacturing
2. Understand and utilize the tools of quality systems
3. Collect, analyze and plot variable and attribute data
4. Determine and use capability indices to describe a process
5. Create and react to control charts
6. Understand the sources of costs for implementing (or not implementing) quality systems
7. Describe various quality systems used in modern manufacturing

Instructional Program: This course will involve readings from the text book and on-line notes. The main activities will involve assembling a portfolio based on a process you will choose. Using this process, you will go through various exercises to give you experience with many techniques used in process control and quality improvement. We will share our work so that we can all get a perspective on the myriad ways the techniques in the class can be applied. The discussion format will also give us the opportunity to provide feedback so that we can each get a better feel for how to improve how we communicate our work to others. In addition, there will be weekly quizzes based on the readings.

The Portfolio: Each student throughout the term will assemble a case study of a particular process, reflecting the methods discussed in class. The portfolio will include data, and analysis of the data, as well as discussions of the results and their meaning, all in terms of the process. Grading of the portfolio will reflect the technical correctness, the appropriate use of data analysis techniques and conveyances, as well as the written discussion as a means of communicating the results and implications of the analysis.

Grading: Your grade will be based on your portfolio. An A will require a complete portfolio, which will include all the techniques discussed in class. As you complete each exercise, I will provide my feedback to you as to what level of work I feel it achieves. You will have the opportunity to improve on the work before you include it in the final portfolio submitted at the end of the term.

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I will also consider in your grade your participation on the discussion boards. You will be posting your work there, but I mainly expect to see you providing feedback (positive and negative) to each other.

A final component of your grade is the timeliness of your submissions. On time submission is critical as we will be comparing each other's work, and even utilizing each other's ideas to improve our own. I will give additional credit to those who take the lead and post their work first.

<u>Grade Component</u>	<u>Criteria</u>	<u>Weight</u>
Quizzes	Demonstration of concepts presented in the readings, using the context of your process. There are no make-ups for missed quizzes.	10%
Weekly portfolio submissions	Timeliness and effort. Late submissions will receive 5% off per day. 5% bonus for work submitted 36-60 hours (noon Saturday) before the deadline, 10% bonus for more than 60 hours before (noon Friday)	30%
Participation (discussion, feedback, attendance)	I expect to see you participating in the discussions at some level for each assignment. The more useful your input, the more points you will receive.	20%
Final portfolio submission	Technical correctness, format, spelling, grammar, effectiveness at communicating meaning.	40%

Course Schedule:

<u>Week</u>	<u>Topic</u>
1	Introduction – definitions and evolution of quality
2 and 3	Control Charts
4 and 5	Continuous improvement and problem solving
6	Capability
7	Advanced charts
8	Attribute Charts
9	Quality costs
10	Quality systems
11	Final week - submit portfolio

Other:

- Assignment/exam calendars may be changed in response to the weather or institutional problems.
- If you have an accommodation from [Accessible Ed & Disability Resources \(AEDR\)](http://www.pcc.edu/resources/disability/) [www.pcc.edu/resources/disability/], please make arrangements to meet with me privately at the beginning of the term to discuss your needs.
- Grades are assigned based on the [PCC grading policy](http://www.pcc.edu/resources/academic/standardspractices/AcademicStandardsandPractices-GradingGuidelines.html) [http://www.pcc.edu/resources/academic/standardspractices/AcademicStandardsandPractices-GradingGuidelines.html]. Students should be aware of the grading options and the associated deadlines.
- In this on-line environment it is very tempting to copy other's work. "Others" include students, authors, web sites, artificial intelligence (e.g. Chat GPT), etc. Use of any of these without specific citation is a violation of PCC's [Code of Student Conduct](https://www.pcc.edu/student-conduct/conduct/student-code-of-conduct-policy-and-procedures/) [https://www.pcc.edu/student-conduct/conduct/student-code-of-conduct-policy-and-procedures/], and really is inappropriate for these assignments (I am not looking for you to use, cite or analyze the work of others, or to use others' work to evaluate yours). All work submitted (portfolio, quizzes) should be the student's original work. Any assignment in violation will receive a zero.
- Students who wish to make an auditory or visual recording of any portion of the class must speak with the instructor ahead of time. Any such recording is for personal use only. It may not be shared, shown to others, copied, uploaded to the Internet, and/or distributed, EVER! Sharing of recorded content is a violation of Oregon state law and of the [PCC Student Code of Conduct Policy and Procedures](http://www.pcc.edu/student-conduct/conduct/student-code-of-conduct-policy-and-procedures/) [www.pcc.edu/student-conduct/conduct/student-code-of-conduct-policy-and-procedures/].
- Here are some other items you should know as a PCC student: <http://catalog.pcc.edu/handbook/s704-syllabus-standardsforcreditcourses/>