



Bachelor of Science Program
Undergraduate

Department of Applied Statistics
Faculty of Applied Science

Course Code 040513315 Statistics Quality Control in Business and Manufacturing (การควบคุมคุณภาพเชิงสถิติในธุรกิจและกระบวนการผลิต)

Name of Institution King Mongkut's University of Technology North Bangkok

Campus/Faculty/Dept/Division Bangkok/Applied Science/Applied Statistics/Applied Statistics

Section 1: General Information

1. Course code and course title

040513311 Statistics Quality Control in Business and Manufacturing
(การควบคุมคุณภาพเชิงสถิติในธุรกิจและกระบวนการผลิต)

2. Total credits

3 credits (3-0-6)

3. Curriculum and course category:

Curriculum: Bachelor of Science Program in Applied Statistics

Course category: Elective subjects

4. Course coordinator/ Instructors

Instructors Prof. Dr. Saowanit Sukparungsee (SWS)

5. Semester/ year of study

1/2026

6. Pre-requisite (if any)

None

7. Co-requisites (if any)

None

8. Venue of study

Faculty of Applied Science, KMUTNB

9. Information for quality assurance in education

This course shows evidence of:

- ☒ Development of implementation from previous practices, e.g. the improvement of class teaching, course content, content classification and methods used for learning assessment
- ☐ Involvement from professional bodies/ external agencies in instruction; thus Enhancing student academic and professional experiences
- ☒ Integration of research or creative activities with instruction; use of research-based



learning management; knowledge management practices for learning improvement

- ☒ Integration of academic services and course implementation
- ☒ Combination of cultural heritage preservation efforts into instruction or student activities

10. Date of latest revision:

June 15, 2026

Section 2: Course Description and Implementation

1. Course Description

Principles and techniques of quality control; statistical process control; basis tools for statistical process control; attribute and variable control charts; advanced control charts; performance measurement of control charts; analysis of capability process; acceptance sampling plans for attributes and variables; continuous and other sampling plans.

2. Number of hours per semester

Lecture	Practice	Self-study
45 hours/semester (3 hours/week)	---	90 hours/semester (6 hours/week)

Course Category ☒ Lecture ☐ Practice

Course Evaluation ☒ A-F ☐ S/U ☐ P

3. Number of hours per week for academic guidance to individual students

1. Giving academic advice (minimally 6 hours per week)
2. Giving academic advice through the LINE application and Google Classroom

4. Course Learning Outcomes (CLOs): Students should be able to:

- CLO 1. Explain the principles of quality control based on statistical principles.
- CLO 2. Can choose to use quality control charts appropriate to the nature of the data.
- CLO 3. Accurately analyze and compare the performance of control charts.
- CLO 4. Demonstrate ethical awareness and professional responsibility in applying knowledge and handling data.
- CLO 5. Apply the program to solve the problem appropriately.



5. The mapping between Expected Learning Outcomes (ELOs) from the curriculum and Course Learning Outcomes (CLOs)

Table 5.1 ELOs-CLOs Consistency

ELOs/CLOs	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
ELO 1 Be honest and responsible and act in accordance with the code of conduct.	✓				
ELO 2 Able to manage data and choose to use methods that can statistics			✓		
ELO 3 Able to analyze data and apply statistical tools appropriately		✓	✓		
ELO 4 Able to synthesize and develop statistical methods appropriately			✓		✓
ELO 5 Able to work with others as a team				✓	
ELO 6 The data can be processed using a statistical package.			✓		✓

Table 5.2 Mapping desirable characteristics of KMUTNB graduates and CLOs

KMUTNB Graduate Attributes/CLOs	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
1. Professional and Thinking Skills		✓	✓		✓
2. Social Responsibility	✓	✓			
3. Innovative and Technopreneur Mindset			✓		✓
4. Global Competence	✓	✓	✓	✓	✓

Section 3: Student Improvement in Relation to Course Learning Outcomes (CLOs)

Organizing learning to develop skills/ knowledge; evaluation of CLOs in accordance with the ones identified in Section 2.4

Course Learning Outcomes (CLOs)	Teaching Methods compliant with CLOs	Evaluation Methods compliant with CLOs
CLO 1	Lecture with examples using PowerPoint, assignment	- Midterm examination Assignment evaluation
CLO 2	Lecture with examples using PowerPoint, assignment	- Midterm examination Assignment evaluation
CLO 3	Lecture with examples using PowerPoint, assignment, case studies, group discussions	- Final exams Assignment evaluation - Teacher observation, idea sharing
CLO 4	Group discussion, assignment	- Assignment evaluation



Course Learning Outcomes (CLOs)	Teaching Methods compliant with CLOs	Evaluation Methods compliant with CLOs
CLO 5	Group discussion, assignment	- Assignment evaluation

Section 4: Lesson Plan and Evaluation

1. Lesson Plan

Week	Topics/Details	CLOs	Hours	Learning and teaching activities; teaching media (if any)	Lecturer
1	Principles of quality control in industry	1	3	Lecture/Examples	SWS
2	Variable Control Chart (x-bar, R, S charts)	1, 2, 5	3	Lecture/Examples	SWS
3	Variables Control Chart (x-bar, S-bar, MR, CUSUM, EWMA, MA, DMA charts)	1, 2, 5	3	Lecture/Examples/ Assign Assignment I	SWS
4	Attributes Control Chart (p และ np charts)	1, 2, 5	3	Lecture/Examples	SWS
5	Attributes Control Chart (c และ u chart)	1, 2, 5	3	Lecture/Examples Hand in Assignment II	SWS
6	Process capability analysis when processes are normally distributed	2, 3	3	Lecture/Examples	SWS
7	Process capability analysis when processes are non-normally distributed	2, 3, 5	3	Lecture/Examples Hand in Assignment III	SWS
8	Review before the midterm exam	1, 2, 3	3	Lecture/Examples/ Hand in Assignment I-III	SWS
9	Midterm examination				
10	Single Sampling Plan	3, 4, 5	3	Lecture/Examples Assign Assignment IV	SWS
11	Double and Multiple Sampling Plans	3, 4, 5	3	Lecture/Examples Assign Assignment V	SWS



Week	Topics/Details	CLOs	Hours	Learning and teaching activities; teaching media (if any)	Lecturer
12	Standard Sampling Plan	3, 4, 5	3	Lecture/Examples/	SWS
13	Continuous Sampling Plans	3, 4, 5	3	Lecture/Examples Assign Assignment VI	SWS
14	Sampling plan for quantitative acceptance	3, 4, 5	3	Lecture/Examples	SWS
15	Sampling plan for quantitative acceptance (continued)	3, 4, 5	3	Hand in Assignment IV-VII	SWS
16	Review before the final exam	3, 4, 5	3	Lecture/Examples	SWS
17-18	Final examination				
		Total	45		

2. Evaluation Plan (in accordance with OBE 2 mapping framework)

Course Learning Outcomes (CLOs)	Evaluation Methods	Week of Evaluation	Percentage of Evaluation
CLO 1, 2, 3	Assignments	3, 5, 7, 8, 10, 11, 13, 15	10%
CLO 1, 2	Midterm examination	9	35%
CLO 3-6	Final examination	17-18	35%
CLO 4	Class participation	Entire semester	10%
CLO 1-6	Test I, II	8, 16	10%

Section 5 Teaching/Learning Resources

Textbooks and materials

- Montgomery, D.C., **Introduction to Statistical Quality Control**, John Wiley & Sons, 20.
- [Harrison M. Wadsworth](#), [Kenneth S. Stephens](#) and [A. Blanton Godfrey](#), **Modern Methods for Quality Control and Improvement**.

Section 6 Course Evaluation and Improvement



1. Course evaluation by students

- ☒ Course evaluation form
- ☒ Group discussions, collaborative exchange of ideas among a teacher and students
- ☒ Behavior reflections
- ☒ Online suggestion, a communication channel set up by instructors
- ☐ Other (specify).....

2. Strategies for assessing learning management

- ☒ Assessment form to evaluate instructors
- ☒ Exam results
- ☒ Review/ verification of student academic performance and learning outcomes
- ☒ Assessment by the Examination Committee
- ☐ Observation by teaching team members
- ☐ Other (specify).....

3. Improvement schemes of course implementation

- ☒ Seminars and workshops on teaching and learning
- ☐ Conducting research on learning pragmatics, both inside and outside classroom contexts
- ☐ Other (specify).....

4. Verification of students' learning outcomes, referred to OBE 2 and 3

- ☒ Setting up a committee to inspect results of learning outcomes assessment, e.g. investigation of examination, grading and performance appraisal
- ☐ Review of scoring and evaluation by the Faculty/ Department academic committee
- ☐ Grading verification by random check from faculty members/ experts who are not in Charge of the curriculum
- ☐ Other (specify).....

5. Course review and improvement plans

- ☒ Annual course revision along with the reviewer suggestions in item 4
- ☐ Annual course revision in consideration of student assessment and comments
- ☐ Other (specify).....