



ENGG8105

Quality and Reliability

Session 2, In person-scheduled-weekday, North Ryde 2023

School of Engineering

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Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

General Information

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Credit points

10

Prerequisites

Admission to MEngMgt

Corequisites

Co-badged status

Unit description

The unit aims to deliver the insights, knowledge and skills necessary to operate engineering projects with professional standards by maintaining quality and reliability. The unit will cover a broad range of topics for all engineering graduates that include total quality management, productivity and cost relationships; quality systems and their components, international standards; interaction between quality and design functions; quality control; quality improvement; process capability and improvement studies; control charting; techniques for quality studies and design for quality improvement.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

ULO1: Apply international standards for quality control and quality improvement.

ULO2: Apply knowledge of quality control to evaluate the impact on the engineering discipline and on business management, supply chain solutions and project management.

ULO3: Conduct total quality management, including determining productivity and cost relationships, utilising quality systems and their components and the interaction between quality and design functions.

ULO4: Synthesize advanced and integrated knowledge of process capability and improvement studies, control charting, techniques for quality studies and design for quality improvement.

General Assessment Information

Student Responsibilities

Be familiar with University policy and College procedures and act in accordance with those policies and procedures.

It is the responsibility of the student to retain a copy of any work submitted. Students must produce these documents upon request. Copies should be retained until the end of the grade appeal period each term.

The student is to perform the required due diligence for their assessment grade and rectify as soon as possible upon finding any errors.

Late Assessment Submission Penalty

From 1 July 2022, Students enrolled in Session-based units with written assessments will have the following university standard late penalty applied. Please see <https://students.mq.edu.au/study/assessment-exams/assessments> for more information.

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark) will be applied each day a written assessment is not submitted, up until the 7th day (including weekends). After the 7th day, a grade of '0' will be awarded even if the assessment is submitted. Submission time for all written assessments is set at 11:55 pm. A 1-hour grace period is provided to students who experience a technical concern.

For any late submission of time-sensitive tasks, such as scheduled tests/exams, performance assessments/presentations, and/or scheduled practical assessments/labs, students need to submit an application for Special Consideration.

Practical Component

Attendance of practical classes is mandatory before submitting the lab report. Lab reports submitted without attending the practical session will get a grade of '0' even if the assessment is submitted by the due date. A special consideration request must be submitted and approved if any student is unable to attend a practical session to organize alternative arrangements.

Resubmission option

Resubmission of any assessment task is not allowed under any circumstances.

Notifications

Formal notification of assessment tasks, grading rubrics, and due dates will be posted on iLearn. Although all reasonable measures to ensure the information is accurate, The University reserves the right to make changes without notice. Each student is responsible for checking iLearn for changes and updates.

Report and Assignment Tasks

Assignment Problems will be posted on iLearn at least one week before their submission date. Assignment solutions will be posted within a week after the submission date. Submissions will not be accepted once the solution is posted.

Assignment submissions and plagiarism policies

All assignments and reports must be submitted electronically through iLearn (in pdf format). Submissions will undergo plagiarism checkers using the Turnitin software and any work deemed to have a 30% or higher similarity score may incur an academic penalty. For more details on the policies of academic penalties relating to academic honesty, please refer to the policies and procedures section below.

Submissions are expected to be typed set in a logical layout and sequence. Markers WILL NOT grade poorly organized or illegible scans or drafts. The expected workload includes the preparation of final copies and clear diagrams.

Grading and passing requirements for unit

For further details about grading, please refer below to the policies and procedures section.

In order to pass this unit, a student must obtain a mark of 50 or more for the unit (i.e. obtain a passing grade P/ CR/ D/ HD).

The unit will be graded according to the Macquarie University Grading policy. The following grades will be used according to the listed numerical range:

ASSESSMENT GRADES AND STATUS

GRADE RANGE STATUS ('Standard Grade' in AMIS) DESCRIPTION

HD 85-100 Pass Provides consistent evidence of deep and critical understanding in relation to the learning outcomes. There is substantial originality, insight, or creativity in identifying, generating, and communicating competing arguments, perspectives or problem-solving approaches; critical evaluation of problems, their solutions, and their implications; creativity in the application as appropriate to the program.

D 75-84 Pass Provides evidence of integration and evaluation of critical ideas, principles, and theories, distinctive insight, and ability in applying relevant skills and concepts in relation to learning outcomes. There is a demonstration of frequent originality or creativity in defining and analyzing issues or problems and providing solutions; and the use of means of communication appropriate to the program and the audience.

CR 65-74 Pass Provides evidence of learning that goes beyond replication of content knowledge or skills relevant to the learning outcomes. There is a demonstration of substantial understanding of fundamental concepts in the field of study and the ability to apply these concepts in a variety of contexts; convincing argumentation with appropriate coherent justification; communication of ideas fluently and clearly in terms of the conventions of the program.

P 50-64 Pass Provides sufficient evidence of the achievement of learning outcomes. There is a demonstration of understanding and application of fundamental concepts of the program; routine argumentation with acceptable justification; communication of information and ideas adequately in terms of the conventions of the program. The learning attainment is considered satisfactory or adequate or competent or capable in relation to the specified outcomes.

F 0-49 Fail Does not provide evidence of attainment of learning outcomes. There is missing or partial or superficial or faulty understanding and application of the fundamental concepts in the field of study; missing, undeveloped, inappropriate or confusing argumentation; incomplete, confusing, or lacking communication of ideas in ways that give little attention to the conventions of the program.

Final Examinations

Final examinations will typically take place at the end of the semester. For further information, please refer to the Examination Timetable website on www.mq.edu.au

If you receive special consideration for the final exam, a supplementary exam will be scheduled by the faculty during a supplementary exam period, typically about 3 to 4 weeks after the normal exam period. By making a special consideration application for the final exam you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application. Approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

Assessment Tasks

Name	Weighting	Hurdle	Due
Midterm assignment	30%	No	Week 7
Case study response	30%	No	Weeks 3, 5, 6, 8, 9, and 11
Final examination	40%	No	During Final Exam Period

Midterm assignment

Assessment Type ¹: Practice-based task

Indicative Time on Task ²: 16 hours

Due: **Week 7**

Weighting: **30%**

Midterm project and practice based work

On successful completion you will be able to:

- Apply international standards for quality control and quality improvement.
- Apply knowledge of quality control to evaluate the impact on the engineering discipline and on business management, supply chain solutions and project management.
- Conduct total quality management, including determining productivity and cost relationships, utilising quality systems and their components and the interaction between quality and design functions.
- Synthesize advanced and integrated knowledge of process capability and improvement studies, control charting, techniques for quality studies and design for quality improvement.

Case study response

Assessment Type ¹: Case study/analysis

Indicative Time on Task ²: 20 hours

Due: **Weeks 3, 5, 6, 8, 9, and 11**

Weighting: **30%**

Case studies on Engineering Control and Reliability

On successful completion you will be able to:

- Apply international standards for quality control and quality improvement.
- Apply knowledge of quality control to evaluate the impact on the engineering discipline and on business management, supply chain solutions and project management.
- Conduct total quality management, including determining productivity and cost relationships, utilising quality systems and their components and the interaction between quality and design functions.
- Synthesize advanced and integrated knowledge of process capability and improvement studies, control charting, techniques for quality studies and design for quality improvement.

Final examination

Assessment Type ¹: Examination

Indicative Time on Task ²: 24 hours

Due: **During Final Exam Period**

Weighting: **40%**

Final Examination

On successful completion you will be able to:

- Apply international standards for quality control and quality improvement.
- Apply knowledge of quality control to evaluate the impact on the engineering discipline and on business management, supply chain solutions and project management.
- Conduct total quality management, including determining productivity and cost relationships, utilising quality systems and their components and the interaction between quality and design functions.
- Synthesize advanced and integrated knowledge of process capability and improvement studies, control charting, techniques for quality studies and design for quality improvement.

¹ If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

² Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

Managing for Quality and Performance Excellence

11th Edition James Evans and William Lindsay

ISBN: 9780357442036

Unit Schedule

Week	Lecture /Content / Topic	Chapter Ref	STGA: HBR Case Study
1	Introduction and history to Quality	Ch 1	Videos – Rise of Toyota & Quality Management History
2	Total Quality - Foundations	Ch 2	Romeo Engine Plant' - discussion
3	Quality: Customer Focus through engaged workforce.	Ch 3 & 4	Sterling Chemicals Quality and Productivity Improvement
4	Quality as a competitive advantage – strategic management	Ch 11	Videos - https://www.youtube.com/watch?v=iuYIGRnC7J8 https://www.youtube.com/watch?v=jKhLMKbW40o
5	Quality Management Systems and Business Excellence Frameworks	Ch 2 p 80 – 85 Ch 10	Wainwright Industries – Beyond the Baldrige Awards
6	Quality and the role of Business Process Management	Ch 5	Process Reengineering in Emerging Markets
7	Key Performance Measures and the information management system to support Quality	Ch 12	Mid Term Assignment – Improving Supply Chain Resilience
8	Statistical tools that drives process improvement – SPC, DoE	Ch 6	General Micro Electronics Assembly SPC
9	TQM, Lean Six Sigma, and Process Improvement – Part 1	Ch 8	Six Sigma Quality at Flyrock Tyres
10	TQM, Lean Six Sigma, and Process Improvement – Part 2	Ch 9	
11	Design for Quality and Product Excellence	Ch 7	Apple Powerbook Design Quality and time to market
12	Leading, building and sustaining Quality – Change management.	Ch 13	
13	Review		

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Assessment Procedure](#)
- [Complaints Resolution Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

Students seeking more policy resources can visit [Student Policies \(https://students.mq.edu.au/support/study/policies\)](https://students.mq.edu.au/support/study/policies). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au) and use the [search tool](#).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

The Writing Centre

The [Writing Centre](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

Student Services and Support

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)
- [Student Advocacy](#) provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via [AskMQ](#), or contact [Service Connect](#).

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

Changes since First Published

Date	Description
25/09/2023	"Tutor" changed to "teaching staff"