

MCEN90023 Quality and Reliability

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2016, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 36 hours of lectures and up to 30 hours of tutorials, workshops and seminars Total Time Commitment: 200 hours
Prerequisites:	112.5 points of undergraduate engineering subjects OR admission into an Engineering coursework graduate degree
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Students cannot enrol in and gain credit for this subject and - # MCEN40003 Quality Engineering
Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Students Experiencing Academic Disadvantage Policy, academic requirements for this subject are articulated in the Subject Description, Subject Objectives, Generic Skills and Assessment Requirements of this entry. The University is dedicated to provide support to those with special requirements. Further details on the disability support scheme can be found at the Disability Liaison Unit website: http://www.services.unimelb.edu.au/disability/
Coordinator:	Dr Alan Smith
Contact:	ajrs@unimelb.edu.au (mailto:ajrs@unimelb.edu.au)
Subject Overview:	<p>AIMS</p> <p>This subject aims to equip graduates with the insights, knowledge and skills necessary for providing professional engineering input into quality management programmes and maintenance facilities in a range of business environments.</p> <p>INDICATIVE CONTENT</p> <p>Topics covered may include total quality management, productivity and cost relationships; quality systems and their components, including international standards; interaction between quality and design functions; alternate systems approaches, including leading international concepts; quality control: the control function in quality; theory of sampling; the operating characteristic curve; the use of statistical distributions; sampling scheme design and analysis; quality improvement: process variability - measures and interaction with design; process capability and improvement studies; control charting; state of statistical stability; computerisation of process monitoring; cumulative sum techniques for quality studies; experimental design for quality improvement: reliability, measures and frequency distributions; analyses for optimal maintenance; replacement theories; management of the maintenance function.</p>
Learning Outcomes:	<p>INTENDED LEARNING OUTCOMES (ILOs)</p> <p>Having completed this subject the student is expected to be able to -</p> <ol style="list-style-type: none"> 1 Explain what constitutes a quality system (both generally and with respect to international standards) 2 Develop strategies for implementing a quality system and its components 3 Explain and quantify the relationships between process capability and tolerances 4 Analyse and assess all common types of sampling schemes, and design a 'single' attribute or variables sampling scheme

	<p>5 Design, analyse and interpret 'Shewhart-type' process control charts and CUSUMS for process control</p> <p>6 Apply optimisation techniques to maintenance</p> <p>7 Analyse the reliability of systems</p> <p>8 Develop economic strategies for replacing equipment.</p>
Assessment:	<p>One 3-hour examination at the end of semester (65%) One essay of 1000 words (due fifth week) and associated class presentation of 20 minutes and class participation (15%) requiring approximately 20-25 hours of work One assignment and one laboratory report (incl. participation before the tenth week) not exceeding 2200 words each, excluding appendices, computations, diagrams, tables and computer output, Requires approximately 13-15 hours of work each (10% each). ILO 1 & 2 will be assessed by coursework (15%) and examination (15%) ILO 3 – 5 will be assessed by examination (20%) ILO 6 will be assessed by coursework (10%) and examination (8%) ILO 7 will be assessed by coursework (10%) and examination (7%) ILO 8 will be assessed by examination (15%)</p>
Prescribed Texts:	TBA
Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	<ul style="list-style-type: none"> # Ability to undertake problem identification, formulation, and solution # Ability to utilise a systems approach to complex problems and to design and operational performance # Understanding of the business environment # Ability to function effectively as an individual and in multidisciplinary and multicultural teams, as a team leader or manager as well as an effective team member.
Notes:	<p>LEARNING AND TEACHING METHODS</p> <p>The subject will be delivered through a combination of lectures, seminars, tutorials and workshops that will feature student-centred activities.</p> <p>INDICATIVE KEY LEARNING RESOURCES</p> <p>A lecture outline and reading list will be provided at the start of each section.</p> <p>A book written by the lecturer, Smith AJR, <i>Quality and Reliability Management</i>, 2nd edition, and overheads will be available on LMS.</p> <p>There will be some additional material provided on LMS if and as required or requested by students.</p> <p>CAREERS / INDUSTRY LINKS</p> <p>Quality engineer</p> <p>Maintenance engineer</p> <p>Quality manager</p> <p>Maintenance manager</p>
Related Course(s):	<p>Bachelor of Engineering (Mechanical and Manufacturing Engineering)</p> <p>Doctor of Philosophy - Engineering</p> <p>Master of Engineering Management</p> <p>Master of Engineering Project Management</p> <p>Master of Philosophy - Engineering</p>
Related Majors/Minors/ Specialisations:	<p>B-ENG Mechanical Engineering stream</p> <p>Master of Engineering (Mechanical)</p>