ES382-15 Quality Techniques

24/25

Department
School of Engineering
Level
Undergraduate Level 3
Module leader
Magdalena Rybak
Credit value
15
Module duration
10 weeks
Assessment
40% coursework, 60% exam
Study location
University of Warwick main campus, Coventry

Description

Introductory description

ES382-15 Quality Techniques

Module web page

Module aims

The module aims to enable participants to understand how organizations manage and improve products and processes to generate value for customers and contribute to organizational performance goals. In particular it focuses on how organizations clarify customer requirements, design and develop products and processes which deliver those requirements reliably over time and minimise risk, waste, variation and cost.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

Customer value.
Customer focus.
Financial impact of quality performance.

Lean Six Sigma.
Design for Six Sigma
Risk Management.
Reliability.
Statistical Process Control.
Process Capability.
Quality Function Deployment.
Taguchi Methods.
Failure Modes, Effects and Criticality Analysis.
Value Stream Mapping.
Fault Tree Analysis
Weibull analysis
Reliability block diagrams
Reliability prediction
Reliability testing concepts

Learning outcomes

By the end of the module, students should be able to:

- Communicate the principles and practice of customer focus and the concept of value.
- Assess levels of variability and waste within a process.
- Evaluate risk and assess reliability in complex engineering situations.
- Quantify the impact of these issues on organizational performance.
- Apply appropriate combinations of tools to improve customer value and organizational performance.
- Interpret the outputs of analyses to determine critical causes of poor performance, and present the data effectively to drive action.

Indicative reading list

Quality Management e-book (2011); Graeme Knowles; http://bookboon.com/en/quality-management-ebook ISBN: 0-945320-45-0 (free downloadable PDF written specifically to support the course)
Six Sigma e-book (2011); Graeme Knowles; http://bookboon.com/en/six-sigma-ebook ISBN: 0-945320-45-0 (free downloadable PDF written specifically to support the course)
Practical Reliability Engineering (2012); P.D.T. O'Connor & A. Kleyner; John Wiley ISBN: 978-0-470-97981-5
Design for Six Sigma (2009); K. Yang and B. El-Haik; McGraw Hill: ISBN: 0-07-141208-5
Advanced Topics in Statistical Process Control (1995); D.J. Wheeler; SPC Press ISBN: 0-945320-45-0
Quality management for Organizational Excellence: Introduction to Total Quality 8th Edition (2016); D.L. Goetsch & S. Davis; Pearson; ISBN-13: 9780133791853

Subject specific skills

Knowledge and understanding of the need for a high level of professional and ethical conduct in

engineering and the use of technical literature, other information sources including appropriate codes of practice and industry standards
Ability to conceive, make and realise a component, product, system or process
Ability to be pragmatic, taking a systematic approach and the logical and practical steps necessary for, often complex, concepts to become reality
Ability to be risk, cost and value-conscious, and aware of their ethical, social, cultural, environmental, health and safety, and wider professional engineering responsibilities

Transferable skills

Numeracy: apply mathematical and computational methods to communicate parameters, model and optimize solutions
Communicate (written and oral; to technical and non-technical audiences) and work with others
Exercise initiative and personal responsibility, including time management, which may be as a team member or leader
Awareness of the nature of business and enterprise in the creation of economic and social value
Be professional in their outlook, be capable of team working, be effective communicators, and be able to exercise responsibility and sound management approaches.

Study

Study time

Type	Required
Lectures	20 sessions of 1 hour (13%)
Seminars	3 sessions of 1 hour (2%)
Practical classes	3 sessions of 3 hours (6%)
Other activity	2 hours (1%)
Private study	116 hours (77%)
Total	150 hours

Private study description

Guided independent learning 116 hours

Other activity description

2 x 1 hours examples classes

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Students can register for this module without taking any assessment.

Assessment group D2

	Weighting	Study time
Individual Assignment Individual Assignment 2000 words report	40%	
Examination 2 hour Examination	60%	

- Answerbook Pink (12 page)
- Students may use a calculator
- Engineering Data Book 8th Edition
- Graph paper
- Chartwell Graph Paper - 6572 and 5922
- Cambridge Statistical Tables (blue)

Feedback on assessment

Guided self-assessment supported by written feedback and, by request, further verbal feedback. Cohort level feedback on examinations

Past exam papers for ES382

Availability

Courses

This module is Core for:

- Year 3 of UESA-H335 BEng Automotive Engineering
- Year 4 of UESA-H334 BEng Automotive Engineering with Intercalated Year
- Year 3 of UESA-HN12 BEng Engineering Business Management
- Year 3 of UESA-HN15 BEng Engineering Business Management
- Year 4 of UESA-HN13 BEng Engineering Business Management with Intercalated Year
- Year 3 of UESA-HH73 BEng Manufacturing and Mechanical Engineering
- Year 3 of UESA-HH75 BEng Manufacturing and Mechanical Engineering

- Year 4 of UESA-HH74 BEng Manufacturing and Mechanical Engineering with Intercalated Year
- Year 3 of UESA-HH36 BEng Systems Engineering
- Year 3 of UESA-H336 MEng Automotive Engineering
- Year 3 of UESA-HH76 MEng Manufacturing and Mechanical Engineering
- UESA-HH38 MEng Manufacturing and Mechanical Engineering with Intercalated Year
    - Year 3 of HH38 Manufacturing and Mechanical Engineering with Intercalated Year MEng
    - Year 4 of HH38 Manufacturing and Mechanical Engineering with Intercalated Year MEng

This module is Core optional for:

- Year 4 of UESA-H334 BEng Automotive Engineering with Intercalated Year
- Year 4 of UESA-H337 MEng Automotive Engineering with Intercalated Year
- Year 3 of UESA-H115 MEng Engineering with Intercalated Year
- UESA-HH38 MEng Manufacturing and Mechanical Engineering with Intercalated Year
    - Year 3 of HH38 Manufacturing and Mechanical Engineering with Intercalated Year MEng
    - Year 4 of HH38 Manufacturing and Mechanical Engineering with Intercalated Year MEng
- UESA-HH77 MEng Manufacturing and Mechanical Engineering with Intercalated Year
    - Year 3 of HH77 Manufacturing and Mechanical Engineering MEng with Intercalated Year
    - Year 4 of HH77 Manufacturing and Mechanical Engineering MEng with Intercalated Year
- Year 3 of UESA-H11L Undergradaute Engineering (with Intercalated Year)

This module is Optional for:

- Year 3 of UESA-H113 BEng Engineering
- Year 3 of UESA-H114 MEng Engineering
- Year 4 of UESA-H115 MEng Engineering with Intercalated Year
- UESA-H11L Undergradaute Engineering (with Intercalated Year)
    - Year 3 of H11L Engineering (with Intercalated Year)
    - Year 4 of H11L Engineering (with Intercalated Year)

This module is Option list A for:

- Year 4 of UESA-H111 BEng Engineering with Intercalated Year
- UESA-H112 BSc Engineering
    - Year 3 of H112 Engineering
    - Year 3 of H112 Engineering