

UNIVERSITY OF WARWICK

Proposal Form for New or Revised Modules (MA1 - version 7 - April 2014)

Approval information	
Approval Type	<input type="checkbox"/> New module X Revised module <input type="checkbox"/> Discontinue module
Date of Introduction/Change	October 2017
If new, does this module replace another? If so, enter module code and title:	
If revised/discontinued, please outline the rationale for the changes:	<p>The existing module has been around for a number of years largely unmodified. Although satisfaction levels are still good the balance of the module and the value to students in terms of practice is now coming into question. The Quality, Statistics and Reliability elements of the module are historical rather than having a strong rationale. In particular, the statistical element is really revision for the students rather than new or value-adding material. In addition some of the students perceive a disconnect between the Quality and Reliability elements of the module. The revision is aimed at creating a more holistic module rationale and improving connectivity between the elements of the module and workplace skills and practice.</p> <p>The assessment changes reflect the aspiration of the module to reflect better the transferable skills for the workplace; individual and group assignments better assess the practical skills and understanding required of students.</p>
Confirmation that affected departments have been consulted:	Changes were made in consultation with the School of Engineering and WMG.

Module Summary	
1. Module Code (if known)	ES382
2. Module Title	Quality Techniques
3a. Lead department:	Engineering
3b. Teaching Split (if known):	100% WMG
4. Name of module leader	Graeme Knowles

Module Summary											
5. Level	UG: <input type="checkbox"/> Level 4 (Certificate) <input type="checkbox"/> Level 5 (Intermediate) <input checked="" type="checkbox"/> Level 6 (Honours) PG: <input type="checkbox"/> Level 7 (Masters) <input type="checkbox"/> Level 8 (Doctoral) See Guidance Notes for relationship to years of study										
6. Credit value(s) (CATS)	15										
17. Principal 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.										
8. Principal Learning Outcomes	On completion participants will be able to: <ul style="list-style-type: none"> • 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. 										
9. Timetabled Teaching Activities (summary)	<table> <tbody> <tr> <td>Lectures: 20 x 1hour</td> <td>20 hours</td> </tr> <tr> <td>Examples class</td> <td>2 hour</td> </tr> <tr> <td>Lab sessions: 3 x 3 hours</td> <td>9 hours</td> </tr> <tr> <td>Seminar 3 hours</td> <td>3 hours</td> </tr> <tr> <td>TOTAL</td> <td>34 hours</td> </tr> </tbody> </table>	Lectures: 20 x 1hour	20 hours	Examples class	2 hour	Lab sessions: 3 x 3 hours	9 hours	Seminar 3 hours	3 hours	TOTAL	34 hours
Lectures: 20 x 1hour	20 hours										
Examples class	2 hour										
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TOTAL	34 hours										
10. Departmental Web-link	http://www2.warwick.ac.uk/fac/sci/eng/eso/modules/year3/es382/										
11. Other essential notes	Advice and feedback hours are available for answering questions on the lecture material, theory and lab exercises.										
12. Assessment methods (summary)	Examination (50%) Coursework: 50%, consisting of: Group Assignment, including peer assessment (20%); Individual Assignment (30%). Students must pass the examination and pass the coursework overall.										

For use by Strategic Planning and Analytics Office only - Do not fill in this section

Level	JACS3 Code	Teaching Split
		<i>If not provided in 3b above</i>

External Credit Level		Scheme	

Module Context				
13. Please list all departments involved in the teaching of this module. If taught by more than one department, please indicate percentage split.				
14. Availability of module				
Degree Code	Title	Study Year	C/OC/A/B/C	Credits
H330	Automotive Engineering (BEng)	3	C	15
H331	Automotive Engineering (MEng) and variants	3	C	
H332	Automotive Engineering (MEng) with an Intercalated Year	4	C	
H333	Automotive Engineering (MEng) with a year in Research	4	C	
H106	Engineering (BEng)	3	O	
H107	Engineering (MEng) and variants	3	O	
H109	Engineering (MEng) with an Intercalated Year	4	O	
H110	Engineering (MEng) with a year in Research	4	O	
HH73	Manufacturing & Mechanical Engineering (BEng)	3	C	
HH37	Manufacturing & Mechanical Engineering (MEng) and variants	3	C	
HH38	Manufacturing & Mechanical Engineering (MEng) with an Intercalated Year	4	C	
HH39	Manufacturing & Mechanical Engineering (MEng) with a year in Research	4	C	
HH36	Systems Engineering (BEng)	3	C	
HH63	Systems Engineering (MEng) and variants	3	C	
HH64	Systems Engineering (MEng) with an Intercalated Year	4	C	
HH65	Systems Engineering (MEng) with a year in Research	4	C	
15. Minimum number of registered students required for module to run				
1 (Core)				
16. Pre- and Post-Requisite Modules				

Module Context	
N/A	

Module Content and Teaching		
17. Teaching and Learning Activities (<i>totals for module – please see guidance</i>)		
Module duration (weeks)	10 weeks	
Lectures	20 x 1 hour = 20 hours	
Seminars	3 hours	
Tutorials	N/A	
Project Supervision	N/A	
Demonstration	N/A	
Practical Class/Workshops	3 x 3 hours	
Supervised time in studio/workshop	N/A	
Fieldwork	N/A	
External visits	N/A	
Work based learning	N/A	
Placement	N/A	
Year abroad	N/A	
Other activity (<i>please describe</i>): e.g. distance-learning, intensive weekend teaching etc.	Guided independent learning 116 hours 2 x 1 hours examples classes	
18. Assessment Method (Standard)		
Type of assessment	Length	% weighting
Written Examinations	2 Hours	50%
Practical Examinations		
Assessed essays/coursework	Group Assignment, including peer assessment	20%
	Individual Assignment	30%
18a. Final chronological assessment (<i>please see guidance</i>)	Exam	

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

20. Outline Syllabus

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

21. Illustrative Bibliography

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

22. Learning outcomes

Successful completion of the module leads to the learning outcomes. The learning outcomes identify the knowledge, skills and attributes developed by the module.

Learning Outcomes should be presented in the format "By the end of the module students should be able to..." using the table at the end of the module approval form:

Resources

23. List any additional requirements and indicate the outcome of any discussions about these.

Approval	
24. Module leader's signature	Graeme Knowles
25. Date of approval	Teaching Policy Committee Chair's Action 4 April 2017
26. Name of Approving Committee (include minute reference if applicable)	School of Engineering and WMG Teaching Policy Committee
27. Chair of Committee's signature	Professor Gill Cooke
28. Head of Department(s) signature	Professor Nigel Stocks

Examination Information		
A1. Name of examiner (if different from module leader)		
A2. Indicate all available methods of assessment in the table below		
% Examined	% Assessed by other methods	Length of examination paper
50%	20% Group Report, including peer assessment 30% Individual Assignment	2 hours
A3. Will this module be examined together with any other module (sectioned paper)? If so, please give details below.		
A4. How many papers will the module be examined by?	<input checked="" type="checkbox"/> 1 paper <input type="checkbox"/> 2 papers	
A5. When would you wish the exam take place (e.g. Jan, April, Summer)?	Summer	
A6. Is reading time required?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
A7. Please specify any special exam timetable arrangements.		
N/A		
A8. Stationery requirements		
No. of Answer books?	1	
Graph paper?	Yes	
Calculator?	Yes	
Any other special stationery requirements (e.g. Data books, tables etc)?	Engineering Databook Weibull Paper (Chartwell Graph Data Ref 6572) Log-Log Paper (Chartwell Graph Data Ref 5922)	
A9. Type of examination paper		
Seen?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Open Book?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Restricted?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

Examination Information	
If restricted, please provide a list of permitted texts:	N/A

LEARNING OUTCOMES		
(By the end of the module the student should be able to....)	Which teaching and learning methods enable students to achieve this learning outcome? (reference activities in section 15)	Which summative assessment method(s) will measure the achievement of this learning outcome? (reference activities in section 16)
Communicate the principles and practice of customer focus and the concept of value.	Lecture, classroom exercise and individual assignment.	Examination, group and individual assignments.
Assess levels of variability and waste within a process.	Lecture, classroom and laboratory exercises.	Examination.
Evaluate risk and assess reliability in complex engineering situations.	Lecture, classroom and laboratory exercises.	Examination.
Quantify the impact of these issues on organizational performance.	Lectures, classroom exercise and assignments.	Group and individual assignments.
Apply appropriate combinations of tools to improve customer value and organizational performance.	Lecture, classroom exercise, seminar and assignments.	Group and individual assignments.
Interpret the outputs of analyses to determine critical causes of poor performance, and present the data effectively to drive action.	Lecture, classroom exercise, seminar and assignments.	Group and individual assignments.