

## UNIVERSITY OF WARWICK

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

Approval information	
<b>Approval Type</b>	<input type="checkbox"/> New module <input checked="" type="checkbox"/> Revised module <input type="checkbox"/> Discontinue module
<b>Date of Introduction/Change</b>	1 <sup>st</sup> October 2018
<b>If new, does this module replace another? If so, enter module code and title:</b>	ES2B2 Technical Operations Management
<b>If revised/discontinued, please outline the rationale for the changes:</b>	Change from 100% examined assessment to: 70% examined plus 30% group assignment (presentation). The change enables students to demonstrate more of the associated skills and capabilities while better reflecting learning outcomes. The split of assessment reflects separate learning outcomes and the three distinctive subject areas within the module content.
<b>Confirmation that affected departments have been consulted:</b>	Changes have been made in consultation between the School of Engineering and WMG

Module Summary	
<b>1. Module Code (if known)</b>	ES2D8
<b>2. Module Title</b>	Technical Operations Management
<b>3a. Lead department:</b>	WMG
<b>3b. Teaching Split (if known):</b>	100% WMG
<b>4. Name of module leader</b>	Piotr Mazurkiewicz
<b>5. Level</b>	UG: <input type="checkbox"/> Level 4 (Certificate) <input checked="" type="checkbox"/> Level 5 (Intermediate) <input 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
<b>6. Credit value(s) (CATS)</b>	15

<b>Module Summary</b>	
<b>7. Principal Module Aims</b>	This module will provide the students with the ability to demonstrate how engineering businesses can meet the challenges created by the dynamic industrial and commercial environment in which they operate. Students will furthermore be able to employ appropriate quantitative and qualitative techniques to deal with designing and managing operations, managing and assuring quality with awareness of risks involved. Students will also be able to apply and use the tools and techniques studied in context of product life cycle management with emphasis on principles of sustainable development.
<b>8. Principal Learning Outcomes</b>	By the end of the Module students will be able to: <ul style="list-style-type: none"> <li>• Discuss the importance and interdependence of major elements of design of operation management system including, but not limited to planning, organisational structures with assessment of appropriate leadership and management styles and control in order to improve operations and identify a relevant selection of tools and techniques for a variety of engineering businesses;</li> <li>• Examine the need to accept commercial risk and be aware of techniques to evaluate and manage risk;</li> <li>• Appraise lifecycle assessment and management principles in dynamic business environments and its relevance to sustainable development concepts with both qualitative and quantitative approaches emphasising associated risks and relevant assessment frameworks;</li> <li>• Discuss the importance of quality in engineering products and services and be aware of the tools and techniques to prevent, identify, measure and control quality problems and drive continuous improvement;</li> <li>• Address awareness of relevant ethical and regulatory requirements including personnel, health &amp; safety, traceability and international standards.</li> </ul>
<b>9. Timetabled Teaching Activities (summary)</b>	27 hour lectures (9 x 1hour and 9 x 2 hours lectures) 3 x 1 hour revision lectures classes 2 x 2 hour labs <b>Total 34 hours</b>
<b>10. Departmental Web-link</b>	<a href="http://www2.warwick.ac.uk/fac/sci/eng/eso/modules/year2">http://www2.warwick.ac.uk/fac/sci/eng/eso/modules/year2</a>
<b>11. Other essential notes</b>	Advice and feedback hours will be used for discussions on module content and exam revision
<b>12. Assessment methods (summary)</b>	70% 2 hour written exam and 30% group presentation including peer assessment.

**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	
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<b>Module Context</b>				
<b>13. Please list all departments involved in the teaching of this module. If taught by more than one department, please indicate percentage split.</b>				
WMG (100%)				
<b>14. Availability of module</b>				
Degree Code	Title	Study Year	C/OC/A/B/C	Credits
H113	BEng Engineering	2	C	15
H114	MEng Engineering	2	C	15
H161	BEng Biomedical Systems Engineering	2	C	15
H163	MEng Biomedical Systems Engineering	2	C	15
H216	BEng Civil Engineering	2	C	15
H217	MEng Civil Engineering	2	C	15
H315	BEng Mechanical Engineering	2	C	15
H316	MEng Mechanical Engineering	2	C	15
H335	BEng Automotive Engineering	2	C	15
H336	MEng Automotive Engineering	2	C	15
H605	BEng Electrical and Electronic Engineering	2	C	15
H606	MEng Electrical and Electronic Engineering	2	C	15
H63W	BEng Electronic Engineering	2	C	15
H63X	MEng Electronic Engineering	2	C	15
HH35	BEng Systems Engineering	2	C	15
HH31	MEng Systems Engineering	2	C	15
HH75	BEng Manufacturing and Mechanical Engineering	2	C	15
HH76	MEng Manufacturing and Mechanical Engineering	2	C	15
HN11	BSc Engineering and Business Studies	2	C	15
HN15	BEng Engineering Business Management	2	C	15
<b>15. Minimum number of registered students required for module to run</b>				
<b>1 (Core)</b>				
<b>16. Pre- and Post-Requisite Modules</b>				

<b>Module Content and Teaching</b>	
<b>17. Teaching and Learning Activities</b> ( <i>totals for module – please see guidance</i> )	
<b>Module duration (weeks)</b>	<b>10 weeks</b>

Module Content and Teaching		
Lectures	9 x 1hour and 9 x 2 hours lectures	
Seminars		
Tutorials	3 x 1 hr revision classes	
Project Supervision		
Demonstration		
Practical Class/Workshops	2 x 2 hr labs (formative) (these comprise of one lab on 'Just in time Principles', the other on 'Production Scheduling')	
Supervised time in studio/workshop		
Fieldwork		
External visits		
Work based learning		
Placement		
Year abroad		
Other activity <i>(please describe): e.g. distance-learning, intensive weekend teaching etc.</i>	<b>Guided independent learning 116 hrs</b>	
<b>18. Assessment Method (Standard)</b>		
Type of assessment	Length	% weighting
Written Examinations	2 Hours	<b>70</b>
Practical Examinations		
Assessed essays/coursework	20 minutes group presentation including peer assessment (slides submitted with voice-over recording)	<b>30</b>
<b>18a. Final chronological assessment</b> <i>(please see guidance)</i>	<b>Examination</b>	

### 19. Methods for providing feedback on assessment.

Formative feedback given during labs and revision classes.  
 Group feedback in form of standardised feedback sheet for group presentation assignment  
 Solutions and feedback to the examination paper for this module will be released at an agreed date after the examination has taken place.  
 Cohort level feedback on examinations.

### 20. Outline Syllabus

**Operations Management:**

Design of the operation – design of the product & service, supply network, layout & flow and jobs & work organisation.

Transition to operation – operation readiness and monitoring

Information management systems

Organisational structure with relevant leadership and management styles

Planning & control of the operation - capacity management; change management

Enterprise Resource Planning (ERP), Agile against Lean systems (with introduction of major lean systems elements and tools

Importance of continuous improvement and transition towards learning organisations.

**Quality Management:**

Management for Quality: philosophy, participation and people issues, structures and organisation.

Design for Quality: customer requirements definition and validation, reliability/verification issues.

Process Management: understanding variability, quality tools and techniques (fishbone, Pareto, SPC, TPM), continuous improvement and waste reduction. Quality Systems: ISO 9001, ISO 14000, Business Excellence Model.

**Life Cycle Management & Sustainability**

Product lifecycle management (PLM): increasing complexity and regulations trends

Present product lifecycles against sustainable development frameworks

Life cycle impact assessment : cradle to grave vs cradle to gate

ISO 14040: framework for environmental management

**21. Illustrative Bibliography**

Heizer, J & Render, B (2014) "Operations Management", 11th ed; Pearson Education UK

Knowles, G; (2005) "Quality Management" (Bookboon), ISBN: 978-87-7681-875-3

Knowles, G; (2005) "Six Sigma" (Bookboon), ISBN: 978-87-7681-852-4

Krajewski, L.J; Ritzman, L.P. & Malhotra, M.K. (2013) "Operations Management", 10th ed. Pearson Education UK

Slack, N; Brandon-Jones, A & Johnston, R. (2016) "Operations Management", 8th ed; Pearson Education, UK

Basu, S. (2017) Plant Hazard Analysis and Safety Instrumentation Systems [online] Academic Press is an imprint of Elsevier. available from <<https://0-www-sciencedirect-com.pugwash.lib.warwick.ac.uk/science/book/9780128037638>> [6 April 2018]

Hill, A. and Hill, T. (2012) Operations Management [online] New York, New York : Palgrave Macmillan. available from

<[http://encore.lib.warwick.ac.uk/iii/encore/record/C\\_\\_Rb3155801\\_\\_Sterry\\_hill\\_\\_P0,1\\_\\_Orightresult\\_\\_U\\_\\_X4?lang=eng&suite=cobalt](http://encore.lib.warwick.ac.uk/iii/encore/record/C__Rb3155801__Sterry_hill__P0,1__Orightresult__U__X4?lang=eng&suite=cobalt)> [6 April 2018]

Malakooti, B. (2013) Operations and Production Systems with Multiple Objectives [online] 1st edn. Wiley. available from

<<https://ebookcentral.proquest.com/lib/warw/detail.action?docID=1574350>> [6 April 2018]

Mitchell, J.S. (2015) Operational Excellence : Journey to Creating Sustainable Value [online] Hoboken, New Jersey : Wiley,. available from

<[http://encore.lib.warwick.ac.uk/iii/encore/record/C\\_\\_Rb2841819\\_\\_Soperational\\_excellence\\_\\_P0,2\\_\\_Orightresult\\_\\_U\\_\\_X6?lang=eng&suite=cobalt](http://encore.lib.warwick.ac.uk/iii/encore/record/C__Rb2841819__Soperational_excellence__P0,2__Orightresult__U__X6?lang=eng&suite=cobalt)> [4 April 2018]

**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**

<b>24. Module leader's signature</b>	Piotr Mazurkiewicz
<b>25. Date of approval</b>	Chair's Action 2 May 2018
<b>26. Name of Approving Committee (include minute reference if applicable)</b>	School of Engineering and WMG Course and Module Approval Committee (CMAC)
<b>27. Chair of Committee's signature</b>	Professor Gillian Cooke
<b>28. Head of Department(s) signature</b>	Professor David Towers

Examination Information		
<b>A1. Name of examiner (if different from module leader)</b>		
<b>A2. Indicate all available methods of assessment in the table below</b>		
<b>% Examined</b>	<b>% Assessed by other methods</b>	<b>Length of examination paper</b>
<b>70</b>	<b>30 Group Presentation including peer assessment</b>	<b>2 hours</b>
<b>A3. Will this module be examined together with any other module (sectioned paper)? If so, please give details below.</b>		
<b>A4. How many papers will the module be examined by?</b>	<input checked="" type="checkbox"/> 1 paper <input type="checkbox"/> 2 papers	
<b>A5. When would you wish the exam take place (e.g. Jan, April, Summer)?</b>	January	
<b>A6. Is reading time required?</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<b>A7. Please specify any special exam timetable arrangements.</b>		
<b>A8. Stationery requirements</b>		
<b>No. of Answer books?</b>	2	
<b>Graph paper?</b>	Yes	
<b>Calculator?</b>	Yes	
<b>Any other special stationery requirements (e.g. Data books, tables etc.)?</b>		
<b>A9. Type of examination paper</b>		
<b>Seen?</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<b>Open Book?</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<b>Restricted?</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<b>If restricted, please provide a list of permitted texts:</b>		

<b>LEARNING OUTCOMES</b>		
<b>(By the end of the module, the student should be able to....)</b>	<b>Which teaching and learning methods enable students to achieve this learning outcome? (reference activities in section 15)</b>	<b>Which summative assessment method(s) will measure the achievement of this learning outcome? (reference activities in section 16)</b>
Discuss the importance and interdependence of major elements of design of operation management system including, but not limited to planning, organisational structures with assessment of appropriate leadership and management styles and control in order to improve operations and identify a relevant selection of tools and techniques for a variety of engineering businesses;	Lectures, laboratories, examples classes	<b>Group presentation</b>  Structured, with use of a given template, MS Power Point slides with slides voice-over discussion and comments. Group mark will be individualised by a peer assessment.
Examine the need to accept commercial risk and be aware of techniques to evaluate and manage risk;	Lectures, examples classes	<b>Group presentation</b> (concept and theory –discussion in specified context) <b>Examination</b> (Tools and techniques, application)
Appraise lifecycle assessment and management principles in dynamic business environments and its relevance to sustainable development concepts with both qualitative and quantitative approaches emphasising associated risks and relevant assessment frameworks;	Lectures, examples classes	<b>Examination</b>

<b>LEARNING OUTCOMES</b>		
<b>(By the end of the module, the student should be able to....)</b>	<b>Which teaching and learning methods enable students to achieve this learning outcome? (reference activities in section 15)</b>	<b>Which summative assessment method(s) will measure the achievement of this learning outcome? (reference activities in section 16)</b>
Discuss the importance of quality in engineering products and services, and be aware of tools and techniques to prevent, identify, measure and control quality problems and drive continuous improvement;	Lectures, laboratories, examples classes	<b>Examination</b>
Address awareness of relevant ethical and regulatory requirements including personnel, health & safety traceability and international standards.	Lectures, examples classes	<b>Examination</b>