

Integrated Problem Solving Using Six Sigma Methodology

Module Code:	MAE7025-B
Academic Year:	2018-19
Credit Rating:	20
School:	Department of Mechanical and Energy Systems Engineering
Subject Area:	Mechanical and Automotive Engineering
FHEQ Level:	FHEQ Level 7 (Masters)
Module Leader:	Professor Felician Campean

Additional Tutors:

Pre-requisites:

Co-requisites:

Contact Hours

Type	Hours
Lectures	40
Directed Study	160

Availability Periods

Occurrence	Location/Period
BDB	University of Bradford / Semester 1 (Sep - Jan)
BDA	University of Bradford / Semester 1 (Sep - Jan)
BDB	University of Bradford / Semester 2 (Feb - May)
BDA	University of Bradford / Semester 2 (Feb - May)
BDC	University of Bradford / Semester 3 (June - Oct)
BDB	University of Bradford / Semester 3 (June - Oct)
BDA	University of Bradford / Semester 3 (June - Oct)

Module Aims

This module aims to develop an understanding of, and skills in, using fundamental quality improvement tools in the context of a structures process for problem-solving.

Outline Syllabus

Business case and context for Six Sigma DMAIC and Lean;
Problem solving processes
 Six Sigma DMAIC
 8D Team Oriented Problem Solving
Process analysis tools
 Lean concepts
 Process mapping
 Root cause analysis tools, including is/is not development
Analytical analysis tools
 Sample and data collection
 Graphical analysis
 Measurement system analysis (MSA)
 SPC - control charts and capability analysis
Counter measure development tools
 P-Diagram
 Engineering transfer functions
 Design of experiments
Management tools
 FMEA, control plans, engineering standards
 Effective teamwork
 Reporting methods and techniques

Module Learning Outcomes

On successful completion of this module, students will be able to...

- 1 1a. Demonstrate a critical understanding of the attributed of a structured process for engineering problem-solving (DMAIC and 8D)

 1b. Demonstrate a critical understanding of the quality improvement tools which support structured problem solving processes in engineering.
- 2 2a. Demonstrate your ability to select suitable improvement projects, apply a structured processes problem solving and to demonstrate the ability to use quality improvement tools and make decisions based on the use of these tools.
- 3 3a. Demonstrate analytical and problem solving skills, communicate efficiently in a design team and contribute to teamwork facilitation.

Learning, Teaching and Assessment Strategy

This module will be delivered in a short course style, through a combination of formal presentations, hands-on case-studies and interactive group activities. The hands-on case studies aim to reinforce the concepts, principles and theories explored in the presentations and to develop the necessary technical and effective teamwork and facilitation skills for the application of the problem solving process and tools.

Assessment is via an individual report on the application of the DMAIC problem solving process to a specific engineering problems in the workplace. Expected length of the report is 5000 words, including reflection on learning and the effectiveness of processes and tools to real world engineering problems.

For the workplace based element of the module the students will be supported through an effective structure of coaching, mentoring and supervision, provided jointly by the company and the University. Progress will be monitored through a schedule of formal gateway reviews in the workplace, which also provide a structured framework for progress feedback to the students.

Mode of Assessment

Type	Method	Description	Length	Weighting	Final Assess'
Summative	Coursework	5000wd individual report covering application of DMAIC/8D problem solving to a specific work-based engineering problem	5000 words	100%	Yes

Legacy Code (if applicable)

ENG4117D

Reading List

To view Reading List, please go to [rebus:list](#).