

**THE JOURNEY OF EPE432 LEAN SIX SIGMA MANUFACTURING**

**ABSTRACT**

The curriculum of EPE 432: Lean Six Sigma Manufacturing course offered in the School of Mechanical Engineering is specifically designed to embed industry knowledge into the learning experience. Based on three memorandums of agreement (MoA) signed since 2013, the course utilizes various teaching strategies and assessment methods, including problem-based and collaborative learning directly from the industry to provide students with a comprehensive learning experience. By incorporating real-world industrial Plan-Do-Check-Act (PDCA) projects, students can apply their skills and knowledge in practical scenarios. To make the classroom more engaging and enjoyable, the course also utilizes gamification strategies named Legoliv and Help Simulation to mimic real situations. This approach combines problem-based learning, collaborative learning, and gamification to help students apply their knowledge in a real-world setting, work together to solve problems, create new ideas, and make learning more interactive and enjoyable. The curriculum includes individual assessments (e.g., book summary, Pareto assignment with M&M chocolate, and online test using Socrative) and group assessments (e.g., Industrial PDCA project, Jeopardy, class summary through Facebook, presentation) that provide students and lecturers with opportunities to evaluate learning progress and measure knowledge and skills. The course also ensures comfortable physical spaces, effective classroom management, and lecturer roles that foster interaction and collaboration. Lecturers model positive communication and encourage participation and collaboration, enriching the learning environment. After a decade since its inception, EPE 432: Lean Six Sigma Manufacturing course has become a unique program that is exclusively available in USM.

**COURSE OUTCOMES**

- CO1: Able to explain philosophy organizational concept and culture underpinning Lean Six Sigma in the context of manufacturing and services.
- CO2: Able to understand and apply Lean Six Sigma tools in appropriate circumstances and using correct methodologies.
- CO3: Able to understand Lean Six Sigma system in a systematic manner to solve complex problem.
- CO4: Able to understand and apply leader standard work and continuous improvement to sustain the solutions.

**ADDED VALUES**



**USEFULNESS**

**CAREER READINESS**

PDCA projects provide students with the knowledge and skills necessary to succeed in their careers by solving real-world problems.

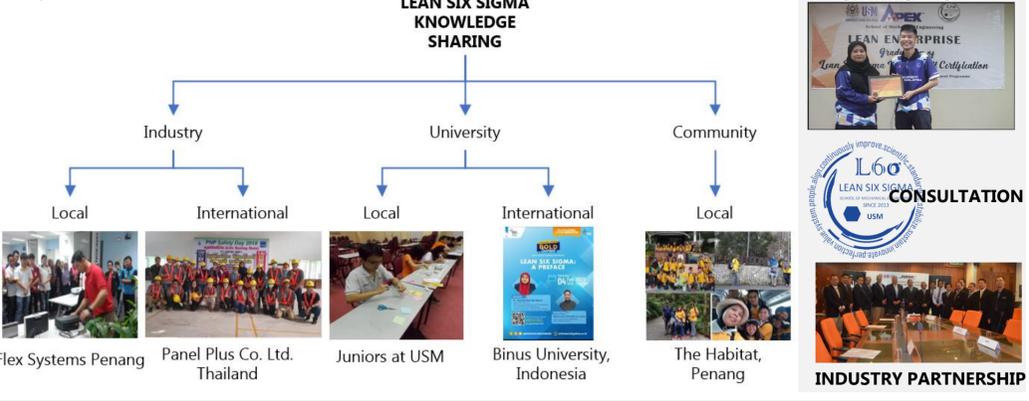
**ENHANCE SKILLS**

Cultivate a diverse set of competencies that are vital for employability, including problem-solving, critical thinking, effective communication, collaborative teamwork, and proficient leadership abilities.

**COMPETITIVE ADVANTAGE**

The demand for Lean Six Sigma knowledge and certification has increased across various industries, creating many career opportunities for professionals with this skillset.

**COMMERCIALIZATION POTENTIAL**



**RECOGNITION**

**Three Memorandums of Agreement (MOAs) have been signed by industries, committing to support the implementation of EPE 432 Lean Six Sigma Manufacturing**



MoA between School of Mechanical Engineering and Bose Systems Malaysia on 10th July 2013



MoA between School of Mechanical Engineering and Bose Systems Malaysia on 8th March 2016



MoA between School of Mechanical Engineering and Flex System Penang on 14th February 2020

**Successfully secures two grants intended for program purposes**



Graduate Employability Grant, MOHE  
RM197,100  
2013 - 2018



Penjana KPT-Pace, MOHE  
RM72,000  
2021



LegoLiv (CO2)



Help Simulation (CO3)



M&M activity (CO2)



Group discussion (CO4)



PDCA presentation (CO1)



**For further details**

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**USM Lean Six Sigma**

