

Liverpool John Moores University

Title: ENGINEERING PROBLEM SOLVING
Status: Definitive
Code: **4506ENGRIV** (117207)
Version Start Date: 01-08-2016

Owning School/Faculty: Maritime and Mechanical Engineering
Teaching School/Faculty: Maritime and Mechanical Engineering

Team	Leader
Russell English	Y
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Academic Level: FHEQ4 **Credit Value:** 10 **Total Delivered Hours:** 60
Total Learning Hours: 100 **Private Study:** 40

Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	20
Practical	40

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Portfolio	AS1	Team-based solutions	30	
Presentation	AS2	Team-based presentation of the solution to a given engineering problem	60	
Reflection	Reflection	Reflection on self awareness	10	

Aims

The module will introduce the students to engineering problem solving strategies and techniques.

Learning Outcomes

After completing the module the student should be able to:

- 1 Effectively work in a team to solve engineering problems
- 2 Use tools and techniques to correctly identify and define the real problem and maximize the generatio of solutions
- 3 Evaluate a solution(s) in terms of its ethics, safety and the environment
- 4 identify and reflect upon the following aspects of personal development: strengths and weaknesses, motivations and values, ability to work with others

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Team-based solutions	1	
Team based presentation	2	3
Reflection	4	

Outline Syllabus

Give an introspective look at the characteristics, the habits, and the actions that effective problem solvers use.

Help develop skills to be an effective and productive member of a team working together to solve problems.

Investigate different methods for information gathering

Use techniques to ensure that the real problem has been defined including critical thinking, the statement/restatement technique and problem analysis.

Provide techniques to help breakdown barriers and preconceived notions that hinder the generation of solutions to the problem.

Enhance the and encourage risk taking in problem solving.

Introduce a number of techniques to help generate solutions including brainstorming, vertical and lateral thinking, futuring, and analogy.

Prioritising solutions

Implement the decisions made using the algorithms developed.

Show how to evaluate the solution implemented, ensuring it completely solves the problem, is ethical, and is safe to people and to the environment.

Demonstrate how all the problem solving techniques presented during the semester can be applied using real life case studies

Learning Activities

Lectures and guided problem solving workshops

Notes

The module will introduce the students to developing independent and creative thinking techniques to assist in solving real engineering problems. The theoretical aspects of the module will be covered in lectures. Each aspect will then be reinforced by practical tutorial examples and activities.