Liverpool John Moores University

Title:	ENGINEERING PROBLEM SOLVING
Status:	Definitive
Code:	**4006ME** (115882)
Version Start Date:	01-08-2012
Owning School/Faculty:	Engineering
Teaching School/Faculty:	Engineering

Team	Leader
Andrew Cunningham	Y

Academic Level:	FHEQ4	**Credit Value:**	10.00	**Total Delivered Hours:**	60.00
Total Learning Hours:	100	**Private Study:**	40		

Delivery Options
Course typically offered: Semester 1

Component	Contact Hours
Lecture	20.000
Practical	40.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Portfolio	AS1	Coursework - Team-based solutions	60.0	
Presentation	AS2	Coursework - Team-based presentation of the solution to a given engineering problem	40.0	

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 generation 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 of the	2	3	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

References

Course Material	Book
Author	Sawyer K.,
Publishing Year	2008
Title	The Creative Power of Collaboration,
Subtitle	
Edition	
Publisher	Basic Books
ISBN	139780465071937

Course Material	Book
Author	Folger H. S., LeBlanc, S. E.
Publishing Year	1995
Title	Strategies for creating Problem-Solving
Subtitle	
Edition	
Publisher	Prentice Hall
ISBN	139780131793187

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.