

### Summary Information

Module Code	7013MSC
Formal Module Title	Operations Research
Owning School	Engineering
Career	Postgraduate Taught
Credits	10
Academic level	FHEQ Level 7
Grading Schema	50

### Teaching Responsibility

LJMU Schools involved in Delivery
Engineering

### Learning Methods

Learning Method Type	Hours
Lecture	11
Tutorial	6

### Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
JAN-CTY	CTY	January	12 Weeks

### Aims and Outcomes

Aims	This module introduces a set of fundamental techniques and tools to assist engineers/managers in making better decisions on in real world management/business problems. It will teach you how to model an operational problem in your business or organisation, how to select and apply a quantitative method to solve it, and how to interpret the results to make a better management decision.
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**After completing the module the student should be able to:**

### Learning Outcomes

Code	Number	Description
MLO1	1	Familiar with fundamental mathematical modelling tools used in Operations Research (OR)
MLO2	2	Model a problem and apply the most appropriate tools to solve solving or optimise optimising it
MLO3	3	Interpret the results to make a better management/business decision

### Module Content

Outline Syllabus	Quantitative methods. Operations Research. Operations Research (OR) solver software. Mathematical Programming: Modelling problems in mathematical programming, Solving operational/management problems using mathematical programming techniques. Sensitivity Analysis: Effect of changes on current optimal settings, Changes in profit or cost, Changes in the availability/capacity/demand of resources. Addition of new products/activities/constraints. Network models and applications: Network modelling and designing networks, Finding the least amount of travel/lines/cables to connect multiple locations. Finding the shortest transport route, Maximising amount of goods sent between locations. Applications of transport models: Dealing with product supplies and demands in multiple locations, . Production scheduling to meet future demands, Allocation of workers/machines to jobs, Transshipment problems
Module Overview	This module introduces a set of fundamental techniques and tools to assist engineers/managers in making better decisions in real world management/business problems. It will teach you how to model an operational problem in your business or organisation, how to select and apply a quantitative method to solve it, and how to interpret the results to make a better management decision. The module develops your skills to apply research methods, modelling and quantitative techniques in an engineering context.
Additional Information	The module is designed to deliver students with the skills to apply research methods, modelling and quantitative techniques in an engineering context

### Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Centralised Exam	Examination	70	2	MLO1, MLO2, MLO3
Report	Report	30	0	MLO2, MLO3

### Module Contacts

#### Module Leader

Contact Name	Applies to all offerings	Offerings
Trung Thanh Nguyen	Yes	N/A

#### Partner Module Team

Contact Name	Applies to all offerings	Offerings
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