

LOG307 Optimisation and Simulation for Decision-Making

Level: 3

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY JAN

Synopsis:

Quantitative models are essential tools in the success of firms in today's highly competitive and complex business environment. LOG307 Optimisation and Simulation for Decision-Making emphasises on analysing, developing and solving quantitative models to support decision-making focussing on the supply chain. Two main modelling techniques - optimisation and simulation - will be employed to solve complex business problems. The course also addresses decision-making under uncertainty as well as the fundamentals of metaheuristic algorithms. Spreadsheet will be used to construct and solve the models. Through hands-on exercises and cases, the course will equip students with problem-solving and analytical skills as well as enhance their digital fluency in a data-driven environment.

Topics:

- Introduction to Optimisation and Simulation
- Linear Programming Problems in Supply Chains
- Integer Linear Programming
- Integer Linear Programming Problems in Supply Chains
- Nonlinear Programming
- Fundamentals of Metaheuristics
- Simulation Fundamentals
- Simulation Tools
- Simulation Modelling
- Solving Supply Chain Problems using Simulation
- Decision-Making under Uncertainty
- Application of Optimisation and Simulation in Practice

Textbooks:

Seyed Mehdi Zahraei and Sugoutam Ghosh: Compiled (eText) Cengage
ISBN-13: 9789814986755

Learning Outcome:

- Apply linear programming models to support decision-making in the industry.
- Solve integer linear programming models to optimise various business decisions.
- Appraise the role of nonlinear programming and metaheuristics in solving complex supply chain problems.
- Analyse different simulation tools for various complex problems.
- Construct simulation models to solve business problems.
- Demonstrate how to make decisions under uncertainty.

Assessment Strategies (Daytime Class):

Components	Description	Weightage Allocation (%)
Overall Continuous Assessment	PRE-COURSE QUIZ 1	2
	PRE-CLASS QUIZ 1	2
	PRE-CLASS QUIZ 2	2
	TUTOR-MARKED ASSIGNMENT 1	18
	GROUP BASED ASSIGNMENT 1	20
	PARTICIPATION 1	6
Overall Examinable Components	ECA-REPORT	32.50
	ECA-VIDEO	12.50
	ECA-POWERPOINT	5
Total		100