

# **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:**

LOG307 Study Guide

ISBN-13: SG-1882

Compiled eText, LOG307 Optimisation and Simulation for Decision-Making Seyed Mehdi Zahraei and Sugoutam Ghosh 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 - Regular Semester (Daytime Class):**

<b>Components</b>	<b>Description</b>	<b>Weightage Allocation (%)</b>
Overall Continuous Assessment	TUTOR-MARKED ASSIGNMENT 1	15
	GROUP BASED ASSIGNMENT 1	20
	PARTICIPATION 1	15
Overall Examinable Components	ECA-REPORT	50
<b>Total</b>		<b>100</b>

\*The information listed is subject to review and change.