



Global Supply Chain Models

2026-2027

Credits: 3

Code: 62002A-00038

Language of Instruction: English

Faculty

Name: Nicky Yates

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Dr Nicky Yates is a Reader (Associate Professor) within the Cranfield University Centre for Logistics, Procurement and Supply Chain Management and Director of Doctoral Programmes for Cranfield School of Management. She has a wide general interest in modelling the supply chain and her teaching and research is mainly focused in this area. She teaches modules on supply chain design and modelling, and simulation on the Full Time and Executive Masters programmes in Logistics and Supply Chain Management and on Critical Thinking and other aspects of researcher development on the doctoral programmes. Her research focusses on simulation and modelling of supply chains, collaboration and technology adoption in supply chains and supply chain resilience. A key focus of her research relates to healthcare supply chain management, the supply of blood and human aspects of resilience are a particular focus.

Prior to joining Cranfield, Nicky spent 6 years working for Unilever and subsequently Birds Eye as a Research Engineer. She is a Chemical Engineer by initial training with a PhD in Food Rheology.

Nicky has been leading the Modelling Global Supply Chains module at AMS since 2016.

Outside of the course running at AMS in January, students are welcome to contact me via my Cranfield email address. Questions specific to the assignment should be directed to the Brightspace discussion forum.

Learning Outcomes

LO1	<i>program specific</i>	The Master in GSCM develops and critically evaluates end-to-end supply chain strategies that align with organizational goals and respond to dynamic market conditions.
	<i>course specific</i>	You evaluate alternative end-to-end network configurations against organizational priorities and scenarios such as demand seasonality, fuel volatility and disruption to recommend a supply chain strategy.
LO2	<i>program specific</i>	The Master in GSCM uses quantitative methods, simulation tools, and optimization models to solve complex supply chain problems and support data-driven decision-making.
	<i>course specific</i>	You formulate and solve spreadsheet-based network models using center-of-gravity, shortest-path and optimization methods to support data-driven facility, routing and allocation decisions.
LO3	<i>program specific</i>	The Master in GSCM analyzes, designs, and manages international logistics flows, distribution systems, and production networks with attention to efficiency, resilience, and sustainability.
	<i>course specific</i>	You design global sourcing and distribution flows by locating facilities, assigning demand and balancing transport cost, resilience, sustainability and service constraints.
LO4	<i>program specific</i>	The Master in GSCM assesses the impact of emerging technologies, data analytics, automation and AI-enabled tools on supply chain performance and leads digital transformation initiatives.
	<i>course specific</i>	You assess the capabilities of commercial network-design software, optimization solvers and emerging technologies and recommend where digital tools can improve supply chain decisions.
LO	<i>course specific</i>	

Course Content

The heart of any logistics and supply chain operation is its network. The location of factories, distribution centres, suppliers, customers and so forth and the means by which they are linked, fundamentally affects the efficiency with which an organisation's network operates. This module aims to introduce the concepts and techniques of network theory and analysis and use these to demonstrate how supply chain networks are designed, redesigned and optimised and how current supply chain trends and challenges are influencing this design. All aspects of the module are illustrated by the use of practical examples, ranging from manual calculations through to computerised network optimisation software. The module is composed of the following sessions:

Session 1: Introduction to Modelling Global Supply Chains

Session 2: The Map Based Approach - A Single Country Case Study

Session 3: Introduction to Spreadsheet Based Models - A European Case Study

Session 4: Advanced Modelling Techniques

Session 5: Network Algorithms for Tactical Planning Session 6: Optimisation in Network Design

Session 7: Emerging Trends in Supply Chain Design

Session 8: Commercial Packages for Strategic Network Design Modelling and Assessment Workshop

Prerequisites

none

Method of Instruction

Lectures - Practice Sessions - Case Study – Discussion – Presentation - Self-study – Paper - Exercises

Assessment Method & Criteria

Individual Coursework Assignment	100%
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Study Materials

Designing and Managing the Supply Chain 3rd edition with Student CD

ISBN: 9780073341521

Authors: Philip Kaminsky, Edith Simchi-Levi, David Simchi-Levi

Publisher: McGraw-Hill Education

Publication Date: 2007-07-23

Readings and other study materials will be available on Brightspace.