

 南开大学  
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## Modern Logistics & Supply Chain Management

### ML & SCM

Module description

*"Management by objectives works if you first think through your objectives. Ninety percent of the time you haven't."*  
Peter Drucker

Dr. Wolfgang Garn  
Winter 2016

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## Outline

- AML&SCM / Learning Outcomes
- Objectives / Module Content
- Lecturer
- Timetable
- Assessment
- Literature

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## Aim

- By the end of the course successful participants will be able to
  - **solve supply chain & logistics problems analytically.**



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### Learning Outcomes - Objectives

- To analyse the efficiency and productivity of business firms;
- To evaluate and define “challenges” in a concise, precise and logical manner;
- To apply a selected number of classical and state-of-the-art Operational Research methods and tools to solve supply chain problems analytically;
- To create solution models and algorithms that offer competitive advantage to the businesses;
- To provide results to the management for decision making and implementation.

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### Logistics & Inventory



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
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### Module Content

Some of the topics that will be covered

- Linear Programming
  - e.g. transportation optimisations
- Network Analysis
  - e.g. Shortest Route, minimal spanning tree
- Inventory Systems
  - e.g. Economic Order Quantity model
- Simulations and Waiting Line Models
  - e.g. Multiple Server Waiting Line

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## Dr Wolfgang Garn

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- Business Analytics programme director
  - at the University of Surrey, UK
  - Research Interests
    - Business Analytics
    - Management Science, Operations & Economics
    - Meta-Heuristics, Decision Science
- 15+ years experience in industry
  - Mainwork (IBM partner)
    - Resource Manager
  - Telekom Austria
    - Management Scientist
  - DTC (MoD, QinetiQ)
    - Researcher
  - Eurobios (Serco, Biffa, Unilever, BP, DHL)
    - Project Manager

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## Timetable

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	Saturday		Sunday		Saturday		Sunday	
	From	To	12 <sup>th</sup> November 2016	13 <sup>th</sup> November 2016	19 <sup>th</sup> November 2016	20 <sup>th</sup> November 2016	19 <sup>th</sup> November 2016	20 <sup>th</sup> November 2016
Morning Session	09:00	09:50	Welcome & Introduction	Logistics – Warehouse Locations	Simulation & Queuing Theory	Inventory Systems		
	10:00	10:50	Production Strategies	Minimal Spanning Tree		Economic Order Quantities		
	10:50	11:00	Linear Programming					
Lunch	11:00	11:50	Practice	Practice	Practice	Practice		
	11:50	12:00	Production Optimisation					
	12:00	12:50	Practice					
Afternoon Session	13:50	14:00	lunch break	lunch break	lunch break	lunch break		
	14:00	14:50	Supply Chain	Network Optimisations	Simulation & Queuing Theory	Inventory Systems		
	15:00	15:50	Transportation Networks	Shortest Path & Max. Flow		Reorder Point Models		
	15:50	16:00	Minimum Cost Flow					
	16:00	16:50	Practice	Practice	Practice	Practice		
	16:50	17:00	Transportation Models	Discussions	Discussions	Discussions		

This timetable is indicative and subject to changes

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## Assessment

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- Final Project (100%)

**Assessment Strategy:**  
 In order to achieve the threshold standard for the award of credits for this module, the student must meet the following criteria related to the learning outcomes:

- apply the theories, conceptual frameworks and methodologies that underpin Modern Logistics & Supply Chain Management;
- prove the ability to synthesise Modern Logistics & Supply Chain Management concepts within an analytical context;
- demonstrate evidence of background reading and research of the academic and practitioner literature relevant to Modern Logistics & Supply Chain Management.

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## Coursework - example

Modern Logistics & Supply Chain Management  
Final Project  
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**LOGISTICS & SUPPLY CHAIN CHALLENGE**

**THE ORANGE FRUIT COMPANY**

The orange fruit company is importing oranges. The raw materials are processed and distributed as finished goods. The company has its main plant located in Cambridge (United Kingdom). You were hired as Logistics & Supply Chain Analyst to help the company in optimising their business operations.

**DATA COLLECTION & SUPPLIER UTILITY FUNCTION**

The company has asked you to analyse five countries to import oranges from. The company said they are interested in importing from Chile, Spain and Italy and two countries of your choice (see Figure 5).

- Choose five countries
- Determine distances, travel time and freight rate.

The freight rate must be given in pounds per ton per 100 miles and it must not be over 10000 pounds per season or per season for your estimations. Assume that the freight rate is fixed for the period of the contract. Assume that the maximum number of monthly shipments for the suppliers are in the range between 10 and 25 (uniform distribution). One shipment carries 22 tons. Investigate on the material. Your output should present:

Full specification available from:

- <http://www.smartana.co.uk/MLSCM/>
- Or email Wolfgang Garn
- [w.garn@surrey.ac.uk](mailto:w.garn@surrey.ac.uk)

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## Literature

**Essential Reading**

- Garn, W., (2010). *Issues in Operations Management*. Pearson Education.
- Ghiani, G., Laporte, G., and Musmanno, R. (2004). *Introduction to Logistics Systems Planning and Control*, Wiley.
- Heizer, J. and Render, B., (2010). *Operations Management*, 10th Edition. Prentice Hall.
- Verma, R. and Boyer, K., (2010). *Operations & Supply Chain Management*, South Western.

**Recommended Reading**

- Ahuja, R.K., Magnanti, T.L., and Orlin, J.B., (1993). *Network Flows*. Prentice Hall.
- Altink, Tayfur and Melamed, Benjamin, (2007). *Simulation modeling and analysis with Arena*. Academic Press
- Frederick S., Hillier, Mark S., Schmedders, Karl, Stephens, Molly, (2014). *Introduction to management science: a modeling and case studies approach with spreadsheets*. 5th Edition. McGraw Hill.
- Hillier, S. and Lieberman, G., (2010). *Introduction to Operations Research*. 9th Edition. McGraw Hill.
- Evans, J., (2013). *Business Analytics: Methods, Models and Decisions*. Pearson Education.
- Kelton, Sadowski and Swets (2010). *Simulation with Arena*, 5th Edition, McGraw Hill.
- Taha, H. A., (2007). *Operations Research – An Introduction*. 8th Edition, Prentice Hall.
- Taylor III, B.W., (2010). *Introduction to Management Science*. 10th Edition, Prentice Hall.

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## Additional Reading

**Background Reading**

- Jain, R., (1992). *The Art of Computer Systems Performance Analysis*. Wiley & Sons.
- Kleinrock, L., (1975). *Queueing Systems, Volume I: Theory*. Wiley Interscience.
- Lawrence, J.A., and Pasternack, B.A., (2002). *Applied Management Science*. 2nd Edition. John Wiley & Sons.
- Nemhauser, G.L., and Wolsey, L.A., (1988). *Integer and Combinatorial Optimization*. John Wiley & Sons.
- Russell, S., and Norvig, P., (2010). *Artificial Intelligence – A Modern Approach*. 3rd Edition. Prentice Hall.

**Journals**

- Supply Chain Management: An International Journal
- International Journal Production Economics
- International Journal of Operations and Production Management
- International Journal of Physical Distribution and Logistics Management
- Interfaces (2\*, ISSN 0926-2644, [interf.journal.informs.org](http://interf.journal.informs.org))
- European Journal of Operational Research (3\*, ISSN 0377-2217, [www.elsevier.com/locate/ejor](http://www.elsevier.com/locate/ejor))
- Management Science (4\*, ISSN 0025-1909, [mns.journal.informs.org](http://mns.journal.informs.org))
- Operations Research (4\*, ISSN 0030-364X, <http://or.journal.informs.org/>)

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