

# ISTANBUL TECHNICAL UNIVERSITY

## Aviation Institute: M.Sc. Air Transport Management

### Course: Operations & Logistics Management in Air Transport

December 14-19, 2015

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#### YOUR INSTRUCTORS:

Professor David Gillen  
Vancouver International Airport Professor of Transportation Policy & Management  
Director, Centre for Transportation Studies  
Sauder School of Business  
University of British Columbia, Vancouver, BC, Canada  
[http://www.sauder.ubc.ca/Faculty/People/Faculty\\_Members/Gillen\\_David](http://www.sauder.ubc.ca/Faculty/People/Faculty_Members/Gillen_David)  
email: [david.gillen@sauder.ubc.ca](mailto:david.gillen@sauder.ubc.ca)

Professor Benny Mantin  
Department of Management Sciences  
University of Waterloo  
Waterloo, ON, Canada  
<https://uwaterloo.ca/management-sciences/about/people/bmantin>  
email: [bmantin@uwaterloo.ca](mailto:bmantin@uwaterloo.ca)

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#### COURSE DESCRIPTION

An airline's ultimate success in creating value depends on how efficiently and effectively it *executes* its strategic goals. This requires a detailed understanding of the processes used to produce and deliver goods and/or services to passengers as well as upstream and downstream in the supply chain. *Logistics & Supply Chain Management* therefore involves the coordination of multiple value-creating processes that are typically fragmented and dispersed across organizational and geographic boundaries. This fragmentation creates opportunities (e.g. lower costs) but also challenges (e.g. longer lead times). Firms therefore need to find a way to exploit the benefits provided by fragmented supply chains, while making sure that the challenges are managed effectively.

This course will provide students with the managerial tools needed to *understand and articulate* the impact of an organization's business processes, and the ability to *analyze and continuously improve* these business processes. The material taught will expose students to the challenges involved in managing the logistics and supply chains as well as understand the complexity of inter-firm and intra-firm coordination. The goal of the course is to develop a framework to address a variety of logistical and supply chain management challenges.

#### COURSE MATERIAL

The textbook listed below, *Matching Supply with Demand*, contains a significant proportion of the conceptual and illustrative material from which lecture material will be drawn. Text material, class presentation slides and notes and other materials will be posted on the course website or handed out in class. The text is recommended, not compulsory.

Cachon, Gerard and Christian Terwiesch (2013), *Matching Supply with Demand: An Introduction to Operations Management*, 3<sup>rd</sup> edition McGraw Hill-Irwin [ISBN 978-0-07-352516-7]

**Cases** will also be an important component of the course. Given the compressed nature of the course, the cases will be short and focus on operations/logistics issues in the airline industry, as much as possible. Students will be placed on teams composed of 5-6 students each. The instructors will establish team membership. There will be a case assignment where students will be presented with a case and be asked to address some questions. The students will work in teams

### **ACADEMIC ASSESSMENT**

There will be a 3-hour exam within one month of completing the course. Students will also be asked to complete a significant case analysis that will count towards the students' final grade 35 percent. Class participation will form 15 percent of the final grade.<sup>1</sup> Final exam will form the balance of the student's final grade of 40 percent. There will also be an in class presentation investigating strategic trade-offs (in the same groups) consisting of 10 percent.

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To help the instructor learn your name, please bring a name tent (i.e., 8.5-by-11-inch sheet folded in half length-wise with your first and last names clearly written with a dark marker) and place it on your desk during each class.

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### **COURSE MAJOR TOPICS**

- Supply Chain Strategy
- Customer Service Goals
  - Packaging, pricing and incentives
  - Defining service levels and links to inventory
  - Order processing design
- Transportation & Logistics Strategy
  - Market structure for services
  - Cost characteristics
  - Pricing and rate structures
  - Consolidation
  - Modal Choice-the tradeoffs
- Inventory Management
  - Forecasting
  - Types of inventories-push and pull
  - Deterministic and stochastic demand models
  - Single period vs multi-period
- Process analysis
  - Flow time, flow rate and Little's Law
  - Capacity analysis
  - Factor substitution
- Queuing systems
  - Bottlenecks
  - Different queuing models (e.g., single vs multi-servers)
- Forecasting and Risk Management
  - Forecasting methods
  - Time series decomposition
  - Regression techniques

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<sup>1</sup> The participation grade is based on the instructors' evaluation of the quality of each student's progress and contribution during the course. Please carefully read all assigned materials, make a serious attempt to complete exercises and answer assigned questions, and be ready and willing to actively engage in the classroom learning experience. Students may be asked to explain concepts in class. The implicit assumption is that we all have something to contribute to the collective learning experience each day, and we all want to benefit from it.

DATE	PERIOD	CLASS TOPICS/Text Chapters	CONTENT / ACTIVITIES
December 14 Monday	AM	Introduction; The process view of the organization, process design and linkages to Strategy	C&T: 1,2
	PM	Understanding the supply process and process capacity;	C&T: 3
December 15 Tuesday	AM	Process Design, Link operations & finance	C&T: 4,5 ,
	PM	The link between operations and finance: Estimating and reducing operating costs; examples from airline industry	C&T: 4,5 1 hour working on airline data
December 16 Wednesday	AM	Variability and queuing	C&T: 8, 9 Problem Set 1, solutions
	PM	Variability and queuing	C&T: 8,9 2 hours case study (customer service)
December 17 Thursday	AM	The newsvendor model; Inventory management	C&T: 12, 14
	PM	Revenue Management, Excel Exercises	C&T: 15, MotherLand case in class 1 hour case study (customer service)
December 18 Friday	AM	Forecasting & Managing Risk	C&T: 14; B:
	PM	Supply chain coordination	C&T: 16; SCM game; Excel simulation ( <b>must bring your laptops!</b> ) 1 hour case study (customer service)
December 19 Saturday	AM	Logistics, Inventory Management and Introduction to Sourcing	B: 6,7
	PM	Sourcing & Negotiation Review of customer service case study	Notes provided 1/2 hour finalizing case study (customer service)