

**TURKISH
AVIATION
ACADEMY**



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Course Introduction

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Istanbul Technical University

Air Transportation Management

M.Sc. Program

Network, Fleet and Schedule

Strategic Planning

28 March 2016

Introductions

- **This week's instructors:**



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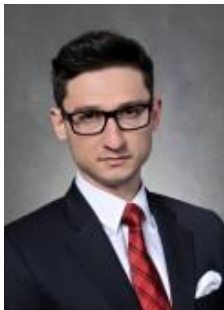


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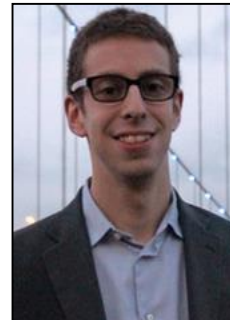


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Introductions

- **ITU Student Introductions:**
 - Your Name
 - Your position in your company
 - What do you hope to learn from this course?



Course Syllabus & Requirements

<u>DAY/TIME</u>	<u>LECTURE TOPICS</u>
MONDAY 28 MARCH	
1000-1115	<u>1. Course Introduction and Airline Industry Overview (Boeing)</u> Course syllabus and requirements; Review of airline terminology and measures; Global airline statistics; Airline business models <u>TEXTBOOK:</u> Chapter 1 (1-13)
1115-1145	<i>Morning Break</i>
1145-1300	<u>2. Airline Current Business Environment (Boeing)</u> Analysis of key developments in the current airline business environment, including economic drivers, passenger airline capacity & demand, air cargo and current airline financial performance.
1300-1400	<i>Lunch</i>
1400-1515	<u>3. World/Europe/Middle East Capacity Analysis (Boeing)</u> A comprehensive overview of the latest capacity situation worldwide and in regional markets involving Turkey. Focus will be placed on growth profiles of major carriers and city-pair markets.
1515-1530	<i>Short Break</i>
1530-1645	<u>4. Turkish Airlines Revenue Planning Guest Presentation</u> Our guest speaker from Turkish Airlines (THY) will share a presentation regarding Network/Revenue Planning at the airline, providing a view of how Turkish Airlines rose into a global carrier in the past decade.
1645-1700	<i>Short Break</i>
1700-1800	<u>5. Airline Network Strategies (Boeing)</u> Recent global airline network strategies; Emphasis on hubs and international growth; Consolidation, alliances & joint ventures, growth plans of emerging global carriers

Course Syllabus & Requirements

TUESDAY 29 MARCH

- 1000-1115 **6. Overview of Airline Planning Process (Boeing)**
Basic airline profit equation; Introduction to airline planning processes – fleet planning, route evaluation, schedules, distribution, operations

TEXTBOOK: Chapter 3 (47-51)
- 1115-1145 *Morning Break*
- 1145-1300 **7. Introduction to Fleet Planning (Boeing)**
Commercial aircraft categories by size and range; Overview of current aircraft types; Global aircraft orders; Turkish Airlines fleet outlook

TEXTBOOK: Chapter 7 (159-166)
- 1300-1400 *Lunch*
- 1400-1515 **8. Evaluation of Alternative Aircraft Types (Boeing)**
Fleet planning evaluation process; Top-down vs. bottom-up approaches; Aircraft selection criteria; Review of NPV analysis.

TEXTBOOK: Chapter 6 (166-170)
- 1515-1530 *Short Break*
- 1530-1645 **9. Fleet Evaluation and Financial Analysis (Boeing)**
An overview of how airlines undertake the fleet evaluation decision in terms of comparative airplane assessment and economic & financial analysis of alternative scenarios
- 1645-1700 *Short Break*
- 1700-1800 **ASSIGNMENT 1 – FLEET PLANNING (Wittman)**
Introduction to problem scenario and use of spreadsheet (provided).
Begin team work on assignment.

Course Syllabus & Requirements

WEDNESDAY 30 MARCH

1000	ASSIGNMENT 1 DUE
<u>1000-11</u>	<u>10. Fundamentals of Airline Markets and Demand (Belobaba)</u> Origin-destination market demand; Dichotomy of demand vs. supply; Price and time elasticity; Implications for pricing and scheduling <u>TEXTBOOK</u> : Chapter 3 (51-67)
1115-11	<i>Morning Break</i>
<u>1145-13</u>	<u>11. Estimation of Demand and Market Share (Belobaba)</u> Demand models and forecasting techniques; Market share vs. frequency share S-curve; QSI and logit modeling approaches <u>TEXTBOOK</u> : Chapter 3 (67-71)
1300-14	<i>Lunch</i>
1400-15	<u>ASSIGNMENT 1 REVIEW and DISCUSSION (Wittman)</u> <u>Discussion of team responses and explanation of solutions to problem scenario.</u>
1515-15	<i>Short Break</i>
<u>1515-16</u>	<u>12. Airline Operating Costs (Belobaba)</u> Drivers and components of airline costs; Flight operating costs; Total vs. <u>unit</u> operating costs; Unit cost components and trends <u>TEXTBOOK</u> : Chapter 6 (127-140, 145-153)
1645-17	<i>Short Break</i>
<u>1645-18</u>	<u>13. Airline Network Structures (Belobaba)</u> Economics of hub operations vs. point-to-point services; Operational and marketing advantages and disadvantages; Route planning implications <u>TEXTBOOK</u> : Chapter 7 (170-175)

Course Syllabus & Requirements

THURSDAY 31 MARCH

- 1000-1115 **14. Route Planning and Profit Evaluation (Belobaba)**
Route profitability evaluation in airline hub networks; Cost allocation and network revenue contribution models

TEXTBOOK: Chapter 7 (175-180)
ARTICLE: Baldanza, B., Measuring Airline Profitability
- 1115-1145 *Morning Break*
- 1145-1300 **15. Modeling Passenger Choice of Flight Options (Belobaba)**
Decision Window schedule coverage model (DWM); Passenger Origin Destination Simulator (PODS); Disutility costs of path/fare options
- 1300-1400 *Lunch*
- 1400-1515 **16. Overview of Boeing Planning Tools (Boeing)**
Boeing will provide a look at the suite of tools and data it uses to perform Network & Fleet Planning studies for our customer airlines, including flight schedule creation, passenger choice model and fleet optimization.
- 1515-1530 *Short Break*
- 1530-1645 **17. Route Forecasting Process (Boeing)**
A step-by-step example of a "real-life" longhaul route traffic and profitability forecast will be provided, utilizing the data and modeling approaches discussed earlier in the course.
- 1645-1700 *Short Break*
- 1700-1800 **ASSIGNMENT 2 – ROUTE PROFIT EVALUATION (Wittman)**
Introduction to problem scenario and use of spreadsheet (provided). Begin team work on assignment.

Course Syllabus & Requirements

FRIDAY 1 APRIL

1000	ASSIGNMENT 2 DUE
<u>1000-1115</u>	<u>18. Airline Schedule Development (Belobaba)</u> Network supply definitions; Steps in schedule development process – frequency, timetable, schedule maps and aircraft rotations <u>TEXTBOOK</u> : Chapter 7 (180-187)
1115-1145	<i>Morning Break</i>
<u>1145-1300</u>	<u>19. Demand, Load and Spill Analysis (Belobaba)</u> Demand variability and spill relative to aircraft capacity; Flight leg spill model; Boeing Spill Tables; Recapture and RM impacts on spill
1300-1400	<i>Lunch</i>
1400-1500	<u>ASSIGNMENT 2 REVIEW and DISCUSSION (Wittman)</u> <u>Discussion of team responses and explanation of solutions to problem scenario.</u>
1515-1530	<i>Short Break</i>
<u>1515-1630</u>	<u>20. Fleet Assignment (Belobaba)</u> Optimization of aircraft size on a flight leg; Principal trade-offs and constraints; Network fleet assignment optimization models <u>TEXTBOOK</u> : Chapter 8 (189-195) <u>ARTICLE</u> : <u>Coldstart</u> : Fleet Assignment at Delta Air Lines
1645-1700	<i>Short Break</i>
1645-1800	<u>ASSIGNMENT 3 – FLEET ASSIGNMENT/SCHEDULING (Wittman)</u> Introduction to problem scenario and use of spreadsheet (provided). Begin team work on assignment.

Course Syllabus & Requirements

SATURDAY 2 APRIL

1000	ASSIGNMENT 3 DUE
<u>1000-1115</u>	<u>21. From Planning to Operations (Belobaba)</u> Planned vs. actual operations; Irregular operations and variability; Overview of airline operations control and schedule recovery <u>TEXTBOOK:</u> Chapter 10 (264-279)
1115-1145	<i>Morning Break</i>
<u>1145-1300</u>	<u>22. Evolution of Airline Revenue Management (Belobaba)</u> Overview of RM models and systems; revenue impacts and tactical/strategic benefits of RM; Leg-based seat optimization and overbooking models. <u>TEXTBOOK:</u> Chapter 5 (99-111)
1300-1400	<i>Lunch</i>
1400-1500	<u>ASSIGNMENT 3 REVIEW and DISCUSSION (Wittman)</u> Discussion of team responses and explanation of solutions to problem scenario.
1515-1530	<i>Short Break</i>
1515-1630	<u>23. Network Revenue Management: O&D Control (Belobaba)</u> Need for O-D control; Overview of network optimization models; simulated revenue gains of O-D controls; impacts on airline business processes. <u>TEXTBOOK:</u> Chapter 5 (112-121)
1645-1700	<i>Short Break</i>
1645-1800	<u>24. New Developments in RM Forecasting and Optimization (Belobaba)</u> Impacts on RM of fare simplification; New forecasting and optimization models for changing fare structures; Alliance RM and customer valuation challenges. <u>TEXTBOOK:</u> Chapter 5 (121-125)

COURSE GRADING

3 Team Assignments (during class week)	45%
Final Exam	55%