

Air Transportation Systems and Infrastructure

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Professor R John Hansman
Professor Amedeo Odoni

The course introduces current practice, developing trends, and advanced concepts for Air Transportation Infrastructure including Airport, Air Traffic Control, and Airline systems. The course describes current systems and management processes, as well as emerging technologies and concepts of operation. It addresses economic and regulatory considerations, as well as key issues such as capacity, congestion, environmental impact and security. A detailed schedule of lectures is provided below:

Course Readings

Richard de Neufville and Amedeo R. Odoni, *Airport Systems: Planning, Design and Management*, Second Edition, McGraw Hill Education, 2013.

Belobaba, P., Odoni, A., and Barnhart, C., (eds.), *The Global Airline Industry*, John Wiley & Sons Publishers, 2013, Second Edition

Monday, April 28, 2014

Morning

Introduction - Overview of Course	ALL
1. Forces and Trends in Air Transportation	Hansman
2. Overview of Air Traffic Control Systems and Processes	Balakrishnan

Afternoon

3. Airport Characteristics	Odoni
4. Geometric Design of Airport Airside	Odoni
5. Regulatory Issues as they Influence Airports and ATC	Odoni

Tuesday, April 29, 2014

Morning

6. Airline Operations I	Hansman
6. Airline Operations II	Hansman
7. Communications Systems	Hansman
7. Navigation Systems (GPS, ILS, VOR)	Hansman

Afternoon

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| 7. Surveillance Systems (RADAR, ADS-B, Multilateration) | Hansman |
| 8. Terminal Area Operations | Balakrishnan |
| 9. En Route and Oceanic Operations | Balakrishnan |
| Preliminary identification of projects | |

Wednesday, April 30, 2014

Morning

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| 10. Airfield Capacity | Odoni |
| 11. Airport Congestion | Odoni |
| 12. Airport Demand Management | Odoni |

Afternoon

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| 13. Impact of Weather on Airspace Operations (Operations, Forecasting, Surveillance) | Balakrishnan |
| 14. Air Traffic Flow Management | Balakrishnan |
| 15. Collaborative Decision-Making | Balakrishnan |

Thursday, May 1, 2014

Morning

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| 16. Design of Passenger Terminals | Odoni |
| 17. Security Systems | Hansman |
| 18. Irregular Operations and Disaster Response Planning | Hansman |
| - Airport Rescue and Fire Fighting | |
| - 727 Crash Example | |

Afternoon

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| 19. Airspace and Airport Operational Data Analysis and Simulation Tools | Balakrishnan |
| 20. Performance Metrics | Balakrishnan |
| Project Discussions | ALL |

Friday, May 2, 2014

Morning

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| (Observational Visit to Istanbul Airport) | (ALL) |
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Afternoon

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| 21. Delay Propagation in the Air Traffic Network | Balakrishnan |
| 22. Assessing and Mitigating Environmental Impacts of Aviation | Balakrishnan |
| 23. ATC Modernization – NextGen and Sesar | Hansman, Balakrishnan |

Saturday, May 3, 2014

Morning

24. Airport Ownership and Management

Odoni

25. Economics and User Charges

Odoni

- Airports

- Air Traffic Control

Afternoon

Project Work,

Wrap-up, Feedback

ALL