

Istanbul Technical University

M.Sc. Program in Air Transportation Management

Course Description: Airport Planning and Management

January 25-30, 2016

Course Intent

Airports provide the major infrastructure used in the provision of commercial airline services. The facilities at an airport determine what types of aircraft an airline can operate. Airports are usually the largest single pieces of real estate in their urban region and they have many impacts on their communities. They also often require huge investments of funds and resources. Thus airport planning is important not only for the airport, but also for their airline customers and the communities they serve. While in the past, airports were thought of as government public utilities, today all airports are operated as businesses, with an increasing number of these businesses being private sector companies. This course is intended to give aviation managers an understanding of key aspects of airport planning and of how airports are operated and managed as economic entities.

Course Instructors:

- **Richard de Neufville**

Dr. de Neufville is Professor of Systems Engineering at MIT. He wrote the textbooks *Airport Systems: Planning, Design, and Management* (with Prof. Odoni) and *Flexibility in Engineering Systems* (MIT Press) as well as 4 others in *Systems Planning and Design*. He founded and led the development of the MIT Technology and Policy Program, which has been replicated at the University of Cambridge and the Delft University of Technology. He has consulted on landside issues with airports “on every inhabited continent”. He is a founding member of the MIT team collaborating on the development of the Singapore University of Technology and Design. He has received many international awards for research and teaching, including the McKelvey Award for Aviation, and the FAA award for Excellence in Aviation Education (with Prof. Odoni).

- **Amedeo Odoni**

Dr. Odoni is the T. Wilson Chair Professor Emeritus of Aeronautics and Astronautics and of Civil and Environmental Engineering at MIT. He has served as Co-Director of the Global Airline Industry Center at MIT (1999-2009) and the FAA’s National Center of Excellence in Aviation Operations Research (1996-2002). He has more than 100 professional publications and 9 books to his credit, including the best-selling textbooks *Airport Systems: Planning, Design, and Management* (co-authored with R. de Neufville) and *The Global Airline Industry* (co-edited with P. Belobaba and C. Barnhart). Dr. Odoni is an elected member of the U.S. National Academy of Engineering, a Fellow of INFORMS, and the recipient of several awards for his teaching and research. He has served as consultant to many of the busiest airports in the world.

- **Joe Sulmona**

Dr. Joe Sulmona is a senior professional with many years of experience with innovative private and public transportation strategy and infrastructure projects. Joe's demonstrated track-record includes leading multi-disciplinary teams in strategic planning, capital and land-use planning, public administration, policy advocacy, project management, stakeholder consultation, commercial development, management training and community service. Joe has led globally significant airport development projects, including for the award-winning Vancouver International Airport Authority where he led strategic planning efforts that successfully positioned YVR as an Asia-Pacific Gateway. In recent years, Dr. Sulmona has provided strategic advisory support in Master Plan development for London Heathrow and London Gatwick, together with successfully delivering the plans for a new airport in the vicinity of Rome, Italy. Dr. Sulmona currently advises on various global transportation strategic initiatives with extensive on-site engagement in Dubai, Abu Dhabi, Doha, Cairo, Khartoum, Amman, Istanbul, and Tehran, together with supporting project efforts in Oman, Iraq, Kuwait, Algeria, Tunisia, and Saudi Arabia. Joe also provides transportation management training for both IATA and Airport Council International (ACI), in addition to an active role in transportation academic research with speciality in the relationship between Advanced Border Controls and transportation planning.

Course Format

- This course is taught over 6 consecutive days, each with 6 hours of classes. Modules will have 15-minute breaks.
- Course language English.
- Teaching level
 - This course is a course in a masters' degree program
 - Students are assumed to have basic knowledge of the aviation industry and most have work experience with an airline, airport or other aviation related business.
 - The course will be taken after completion of the core of the Master's program.

Course Textbooks

- A list of references accompanies course modules. The principal textbook is:

de Neufville, R. and A. Odoni, *Airport Systems: Planning Design and Management*, 2nd Edition, McGraw-Hill Education, 2013.

Course Evaluation

- Students will be graded on a combination of an exam, a project and class participation.

Course Outline

Day 1: Monday, January 25, 2016

Module 1: Introduction: Brief Review of State of the Industry [de Neufville]

Module 2: Airport Planning in the 21st Century [de Neufville]

Module 3: Growing Size and Complexity [Odoni]

Module 4: Demand Patterns; Geometric Design of the Airfield [Odoni]

Module 5: Airport Operations [Sulmona] [2 hours]

Day 2: Tuesday, January 26, 2016

Module 6: Uncertainty in Airport Planning [de Neufville]

Module 7: Airport Forecasting [de Neufville]

Module 8: The Changing Airline industry: impacts on Airports [de Neufville]

Module 9: The Airline-Airport Relationship [Odoni]

Module 10: Airport Governance and Privatization [Odoni] [2 hours]

Day 3: Wednesday, January 27, 2016

Module 11: Airside Capacity [Odoni]

Module 12: Airside and Landside Congestion [Odoni]

Module 13: Slots and Demand Management [Odoni]

Module 14: Airport Environmental Planning and Management [Sulmona] [3 hours]

Day 4: Thursday, January 28, 2016

Module 15: Passenger Building Concepts [de Neufville]

Module 16: Capacity of Airport Passenger Buildings [de Neufville]

Module 17: Passenger Building Design [de Neufville]

Module 18: The Master Plan Process [Sulmona]

Module 19: Security and Facilitation [Sulmona] [2 hours]

Day 5: Friday, January 29, 2016

Module 20: Airport Economics [Odoni]

Module 21: Financing Airport Development [Odoni] [2 hours]

Module 22: Airport Marketing, Revenue Development, Land Development [Sulmona] [3 hours]

Day 6: Saturday, January 30, 2016

Module 23: Effects of Airline Deregulation / Strategic Planning [de Neufville]

Module 24: Multi-airport Systems [de Neufville]

Module 25: Ground Access and Distribution [de Neufville]

Module 26: Airport Terminal Rentals and Concessions [Sulmona]

Planning of Term Projects: Discussion of Projects [All] [2 hours]