INTRAS

Co-funded by the
Erasmus+ Programme
of the European Union

"Transportation services design and management and economics of transportation"

Syllabus

March, 13th, 2019

Version 1

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1   Name of the course

Transportation services design and management and economics of transportation

2   ECTS credits

6 Credits, (**45 hours of Theory + 30 hours of Exercises & Lab**)

3   Objectives

The course introduces students to the fundamentals of urban transportation planning and the types of skills and knowledge that transportation planners need. It further familiarizes students with contemporary transportation planning issues and methods of analysis. The course is highly relevant regardless if students intend to focus on transportation itself, or other aspects of planning.

Transportation decisions impact many aspects of urban life. Young and old alike are affected by the viability and relative ease of travelling to destinations on foot, by bike, transit, or reliance on private vehicles. Transportation investments are arguably the single largest shaper of spaces and of development patterns. The safety, speed, and comfort for a particular mode of travel are a function of the investments that have been made in specific types of travel options. The perspectives of a variety of experts in our region who are engaged in making transportation planning decisions implemented, major highway expansions are planned and being implemented; and considerable investments are proposed and underway in non-motorized infrastructure. Relationships between transportation and land use systems and new tools to address environmental and quality of life impacts of transportation are presented. Transportation investment decisions (or lack thereof) have been held accountable for increased economic prosperity or spiraling economic decline.

To introduce the issues of transportation planning and transportation policy
 To introduce travel survey method for understanding travel behaviour
To introduce the key concepts of the urban transportation planning system
To introduce the fundamental concepts of public transport system such as system, technology and quality of service

4   Learning outcomes

The general expectation regarding the knowledge to be provided/acquired is as follows:

- Basic understanding of what transportation planning is, its theoretical backgrounds and applications
- Skill for collecting data about travel behaviour and analyzing the data for use in transport planning
- Understanding of basic systems, scenarios and phenomena in transportation.
- Identify transportation problems.
- Ability to work in team and communicate with others effectively for transport related topics
- Estimate travel demand.
- Ability to understand the important concepts about public transport system
- Plan transport networks.

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- Identify transport corridors.
- Prepare transportation plans

5 Contents

Unit – I: Introduction:

Role of transportation in the economic development of nations, overview of transport modes, growth trends, National Transport Policy of Europe – Case studies, transportation planning in the developing world; and comparative international transportation policies; Fundamentals of transportation, Principles of planning, evaluation, selection, adoption, financing, and implementation of alternative urban transportation systems; formulation of community goals and objectives, inventory of existing conditions; transportation modeling trip generation, distribution, modal choice, assignment

Unit – II: Data Collection and Inventories:

Collection of data – Organization of surveys and Analysis, Study Area, Zoning, Types and Sources of Data, Road Side Interviews, Home Interview Surveys, Commercial Vehicle Surveys, Sampling Techniques, Expansion Factors, Accuracy Checks, Use o Secondary Sources, Economic data – Income – Population – Employment – Vehicle Owner Ship.

Unit – III: Travel Demand issues:

Trends, Overall Planning process, Long term Vs Short term planning, Demand Function, Independent Variables, Travel Attributes, Assumptions in Demand Estimation, Detailed approach on 4 step travel demand estimation; Sequential, and Simultaneous Approaches, Aggregate and Disaggregate Techniques.

Unit – IV: Demand and supply planning :

Planning for sustainable urban mobility, positive and negative externalities in urban transport, congestion pricing, parking policy, demand management , Urban travel and transportation system characteristics – a systems perspective, Data management and use in decision making , Demand analysis , Urban activity analysis, Supply analysis; Plan Preparation And Evaluation: Travel Forecasts to Evaluate Alternative Improvements, Impacts of New Development on Transportation Facilities. Master plans, Selection of Corridor, Corridor Identification, Corridor deficiency Analysis

Unit – V: Metropolitan cities:

Design issues in urban mobility, integrating land use and transport planning; Overview of urbanization process, city structure and urban activity and infrastructure systems, Economic and social significance of urban infrastructure systems; Transport's Role in tackling Social Inclusion, E conomic Impacts of Transport Policy
Unit – VI: Transportation Alternatives

Intermodal Transportation, Transportation Modes Head-to-Head, Selecting and Managing Transportation Providers, Score carding and Carrier Evaluation, Basic Modes of Transportation

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Unit – VII: Transportation Services

Terminal Services, Consolidation, Dispersion, Shipment Services, Vehicle Services, Interchange Loading & Unloading, Weighing Tracing/Expediting, Line-Haul Services, Consignment, Diversion, Pooling, Stopping in Transit, Transit Privilege.

Unit – VII: Transportation Documentation

Domestic, International, transportation law.

Unit – IX: Fleet Development and Management

Selection of Vehicle and Equipment, Procedures for Repair and Maintenance, Recruitment Selection and Management of Drivers, Fleet Management Replacement and Lifecycle Management.

Unit – X: Transportation Costing and Pricing

Transportation Costing and Pricing Concepts, Key Cost Drivers, Modal Rate Development, Activity Based Costing.

Unit – XI: Transportation Performance Analysis

Symptoms of Poor Transportation Management, Main Key Performance Indicators

Unit – XII: Routing and Scheduling

Importance and Benefits of Route Planning and Scheduling, Vehicle Routing and Scheduling Problems, The Traveling Salesman Problem, Principles of Effective Route Planning and Scheduling.

Unit – XII. Information Technology in Transportation Management

Fleet Management Systems, Route Planning Systems, Tracking Systems, Proof Delivery Systems, Transportation Management Systems

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6   Teaching method

The course consists of 2 hours per week of classroom activity and 2 hours weekly with half the students (medium size group).

The 2 hours in the large size groups are devoted to theoretical lectures, in which the teacher presents the basic concepts and topics of the subject, shows examples and solves exercises.

The 1 hours in the medium size groups is devoted to solving practical problems with greater interaction with the students. The objective of these practical exercises is to consolidate the general and specific learning objectives.

The rest of weekly hours devoted to laboratory practice.

Support material in the form of a detailed teaching plan is provided using the JIZPI laboratory: content, program of learning and assessment activities conducted and literature.

7   Assessment method

Mid-term and final oral and/or written examination, exercises from case studies.

8   Textbooks - Publications - Software

Textbooks
- Introduction to Transportation Planning – M.J.Bruton; Hutchinson of London Ltd.
- Introduction to Urban System Planning –B.G. Hutchinson; McGraw Hill.
- Traffic Engineering and Transport Planning –Kadiyali L.R., Khanna Publishers
- Lecture notes on UTP – Prof. S. Raghavachari, R.E.C.Warangal.
- Metropolitan transportation planning – John W. Dickey, Tata McGraw Hill, New Delhi, 1975
- Urban Transportation Planning, by Michael Meyer, Eric Miller, McGraw Hill
- Urban Transit Systems and Technology John Wiley and Sons, 2007.
- Transit Capacity and Quality of Service Manual, 2nd Edition, Transportation Research Board
- Traffic Engineering, by Roger P. Roess, Elena S. Prassas, and William R. McShane, 3rd Edition, 2004.
- Bina, M. & Kockelman, K. (2009) Location Choice vis-a-vis Transportation: The Case of Recent Home Buyers. The Expanding Sphere of Travel Behaviour Research, Emerald Publishers.
- Rutgers Intelligent Transportation Systems Laboratory (RITS) (2010) Cost/Benefit Analysis of NJDOT Route 18/Hoes Lane Improvement Project. Available online at: http://www.state.nj.us/transportation/works/studies/rt18_i287connect/pdf/cb_analysis.pdf

Selected relevant Publications

Adler, J.L., Blue, V.J., 1998. Toward the design of intelligent traveler information systems. Transportation Research Part C 6 (2), 157–172.

Arnott, R., de Palma, A., Lindsey, R., 1990a. Departure time and route choice for the morning commute. Transportation Research 24B, 209–228.

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Burmeister, B., Haddadi, A., Matylis, G., 1997. Application of multi-agent systems in traffic and transportation. IEE Proc. Software Engineering 144 (1), 51–60.

Softwares

- TransCAD Transportation Planning Software

https://www.caliper.com/tcovu.htm
- Mercurygate TMS software

https://mercurygate.com/

Websites
1. www.IRU.org
2. www.Logistika.uz
3. www.Autotrans.uz
4. www.Intras.uz

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