

SUBJECT TEACHING GUIDE

G1157 - Transport Systems

Degree in Civil Engineering

Academic year 2019-2020

1. IDENTIFYING DATA					
Degree	Degree in Civil Engineering			Type and Year	Optional. Year 3
Faculty	School of civil Engineering				
Discipline	Subject Area: Transport Engineering Optional Subjects: Other Specialities 1 Optional Subjects: Other Specialities 2				
Course unit title and code	G1157 - Transport Systems				
Number of ECTS credits allocated	6	Term	Semester based (1)		
Web					
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. TRANSPORTES Y TECNOLOGIA DE PROYECTOS Y PROCESOS
Name of lecturer	ANGEL IBEAS PORTILLA
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Other lecturers	BORJA ALONSO OREÑA RUBEN CORDERA PIÑERA ANDRES RODRIGUEZ GUTIERREZ

3.1 LEARNING OUTCOMES

- Modelling mobility by private and public transport in an area
- Knowing the theory and basis of classic transport models
- Applying well – known transport models, selecting the best suited to each case.
- Understanding flow theory and its behaviour in transport networks
- Calibrating demand transport models and network assignment models
- Correction and use of sampled data
- Knowing how to implement transport models and solution algorithms using a programming language

4. OBJECTIVES

- The main objective is to understand basic concepts in the field of transport planning, demand models and user' behaviour when the agents are going to plan and make a trip.
- The student should understand classic transport models and algorithms used in the professional world

6. COURSE ORGANIZATION

CONTENTS

1	1 Lesson 1. Introduction: Transport models 1.1 Models and transport planning 1.2 Supply and demand 1.3 Restrictions and conditions 1.4 Modelling approaches and the classical transport model
2	2 Lesson 2 Sampling and data acquisition 2.1 Sampling theory 2.2 Revealed preferences surveys 2.3 Stated preferences surveys 2.4 The spatial model: transport network and zoning
3	3 Lesson 3 Trip Generation Models 3.1 MLR models 3.2 Multiple Classification Analysis 3.3 Simplified models for trip production
4	4 Lesson 4. Trip distribution models 4.1 Models classification 4.2 The gravitational model: entropy maximization 4.3 Bi-proportional and tri-proportional models. 4.4 Matrix estimation using traffic counts 4.5 Aggregate models of trip distribution-modal choice
5	5 Lesson 5. Mode choice modelling 5.1 Discrete choice models (I): multinomial Logit 5.2 Discrete choice models (II): hierarchical Logit 5.3 Specification and estimation of discrete choice models
6	6 Lesson 6. Assignment models to private and public transport 6.1 Network theory: minimum route problem 6.2 Assignment without congestion: all-or-nothing and stochastic assignment 6.3 Public transport assignment models

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Final deliverable	Work	No	No	50,00
Final Exam	Written exam	Yes	Yes	40,00
Classroom exercises	Others	No	Yes	10,00
TOTAL				100,00
Observations				
The second change exam will be only for students who have passed the course work.				
Observations for part-time students				
Final deliverable is mandatory to pass the course. Part time students must justify their status.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC
Juan de Dios Ortúzar y Luis G. Willumsen (2008) "Modelos de Transporte". Traducción de Ángel Ibeas Portilla y Luigi dell'Olio. Ediciones de la Universidad de Cantabria
Borja Alonso, José Luis Moura, Ángel Ibeas y Luigi dell'Olio (2012) "Ejemplos Prácticos de Sistemas de Transporte". Servicio de Publicaciones de la ETS de Ingenieros de Caminos, Canales y Puertos.
Ángel Ibeas, Felipe González, Luigi dell'Olio y José Luis Moura (2015) "Manual de Encuestas de Movilidad. Preferencias Reveladas". Charleston (USA), CreateSpace
Ángel Ibeas, Felipe González, Luigi dell'Olio y José Luis Moura (2015) "Manual de Encuestas de Movilidad. Preferencias Declaradas". Charleston (USA), CreateSpace