



TRANSPORTATION PLANNING AND MANAGEMENT ON THE TERRITORY

M.Eng. in Civil Engineering

Course 2019-2020 (Q1 quarter, #250409)

Schedule: Wednesdays and Fridays, from 10.10am to 12noon. Classroom: A1-102.

Responsible: Prof. Francesc Robusté (f.robuste@upc.edu, office B1-101, cell phone: +34 619468940).

Other lecturers: Dr. Miquel A. Estrada, Dr. Manel Grifoll, Dr. Pere Macias, Dr. Adriana Martínez, Dr. Elisabet Roca, Dr. Francesc Soriguera. Guest speakers F. Gutiérrez and O. Altisench.

Structure: two parts, T (concepts) and C (cases). Part T (theory) includes the background, scientific issues and further readings. Part C (cases) includes professional cases, mainly related to Barcelona, Catalonia or Spain, trying to illustrate how the principles have (or have not) been implemented in practice and showing the real life constraints that face implementations (they may include guest speakers).

Background: basic Calculus, Algebra, Physics, Geometry and Probability plus specific Transportation Engineering background on Location, Mathematical Programming, Demand modeling, Operations (trajectories and queues), and Microeconomics. **Review** material in Atenea intranet.

Evaluation:

- **Attendance (A):** class attendance by signing the attendance sheet. Weight = 10%. You can miss 2 classes. If you attended n classes out of $N=26$ ($n \leq N$), $A = 10 \min\{n/(N-2); 1\}$. Cheating by signing by someone else will imply failing the subject. Attendance only helps to improve the grade.
 - **Quizzes (Q):** two short multiple-choice exams on **Nov 15 2019**, and **Jan 17 2020**, at 10:10am. The quiz grade is the arithmetic average: $Q = (Q_1 + Q_2)/2$.
 - **Exam rehearsal:** self-grading (exam and solution will be posted in Atenea one week before).
 - **Exam of modeling (M)** on **Nov 15, 2019**. Re-sit on **Jan 17, 2020**. You need $M \geq 3$ to count Attendance A in the final grade.
 - **Report (R)** is an individual report among a list of topics. **Due: Jan 17, 2020**.
 - **Exam (E)** is the arithmetic average of the quizzes and the modeling exam: $E = (Q + M)/2$.
- Final grade: **Grade** = $(A + 7E + 2R)/10$ if $M \geq 3$ and $A > M$. If $M < 3$ or $A < 3$, **Grade** = $(7E + 2R)/9$.

Official grades of all passing grades (≥ 5) **will be magnified** following the re-escalating algorithm of the Civil Engineering School (5% A+, 30% A, 30% B, 35% C). “**Curricular evaluation**” for grades ≥ 4 (Civil Eng. School).

Teaching and learning methods, expected learning results, competences: See Camins OpenCourseWare. Previous to each class, a Powerpoint file, a Word file, and few complementary readings will be posted in the intranet (Atenea). Each lesson will include **references, key learning goals, expected background, evaluation hints** or old exam questions and **exercises** or **cases**.

Vertical contents: Transportation Planning and Management principles and applications.

Transversal concepts: Economic and Social Territory, City and Regional Planning, Sustainability, Environment, Energy, Accessibility, trade-off Supply vs Demand, trade-off Global vs Local, Functionality, Transportation System Management, etc.

References:

- Daganzo, C. *Fundamentals of transportation and traffic operations*. Pergamon, 1997.
- Dupuy, G. *El urbanismo de las redes*. Oikos-Tau. 1996.
- Jara-Díaz, S. *Transport Economic Theory*. Emerald. 2007.
- Meyer, M. & E. Miller. *Urban Transportation Planning*, Ed. Mc Graw Hill, 2001.
- Oppenheim, N. *Urban Travel Demand Modelling*, John Wiley & Sons, Inc., 1995.
- Ortúzar, J.D. & L. Willumsen. *Modelling transport*. John Wiley. 4th edition, 2011.
- Sinha, K.C. and S. Labi. *Transportation Decision Making*. John Wiley, 2007.

ATENEA intranet:

*PLANIFICACIÓ I
GESTIÓ DEL
TRANSPORT EN EL
TERRITORI (250409)*








Pw: TRANSPORT2019



TRANSPORTATION PLANNING AND MANAGEMENT ON THE TERRITORY COURSE 2019 – 2020 (Q1)

Session (2h)	Lecturer	Topic
Sep 25, 2019	Robusté	0.Introduction. 0.Old topics review. 1.Transportation system.
Sep 27, 2019	Robusté	2. Location.
Oct 02, 2019	Robusté	3. Geometrical probability in planning and optimization.
Oct 04, 2019	Estrada	9. Taxicabs, ridesharing and MaaS.
Oct 09, 2019	Robusté	4. Networks and accessibility.
Oct 11, 2019	Robusté	5. Transportation problems and solution generation.
Oct 16, 2019	Robusté	6. Pricing.
Oct 23, 2019	Robusté	8A. Appraisal 1: Cost-benefit analysis.
Oct 25, 2019	Robusté	8B. Appraisal 2: Multicriteria evaluation.
Oct 30, 2019	Estrada	10. Logistics 1 - Vehicle routing.
Nov 06, 2019	Estrada	11. Logistics 2 - City logistics.
Nov 06, 2019	Robusté	12:10h - 7. Planning. Case: L9 metro line in Barcelona.
Nov 08, 2019	Robusté	13. Apps and business models in smart mobility.
Nov 13, 2019	Soriguera	12. Variable speed limits in Barcelona.
Nov 15, 2019	Robusté	PARTIAL EXAM: QUIZ1 + MODELING (@ 10:10).
Nov 20, 2019	Robusté	Case 6: Mobility 4.0.
Nov 22, 2019	Robusté	Case 2: Terminal T1, BCN airport. Guest: Francisco Gutiérrez.
Nov 27, 2019	Estrada	Case 4: Bus network layout & operation in Barcelona and Lleida.
Nov 29, 2019	Grifoll	Case 10: Barcelona port and BEST container terminal.
Dec 04, 2019	---	<i>Team working</i>
Dec 11, 2019	Robusté	Case 7: Air quality and mobility.
Dec 13, 2019	Macias	Case 1: Infrastructure planning in Spain.
Dec 18, 2019	Estrada	Case 5: Electro-mobility.
Dec 20, 2019	Robusté	Case 8: Mobility in developing cities/countries.
Jan 08, 2020	Robusté	Case 3: Tramway link in Barcelona. Guest: Oriol Altisench.
Jan 10, 2020	Martínez	Case 9: Economics of quality in road pavements.
Jan 15, 2020	Roca	Case 11: Social issues and participation.
Jan 17, 2020	Robusté	FINAL EXAM: QUIZ2 + Modeling RE-SIT (@10:10).

Lecturers:

	Dr. Miquel A. Estrada	Associate Professor of Transportation. Dr. Civil Engineer (BarcelonaTech). Head of Studies of Master in Civil Engineering, Civil Engineering School. BIT research group.
	Dr. Manel Grifoll	Associate Professor of Transportation. Dr. Civil Engineer (BarcelonaTech). ViceDean of int'l relations and research at the Nautical Faculty of Barcelona. BIT research group.
	Dr. Pere Macias	Assistant Professor of City Planning. Dr. Civil Engineer (BarcelonaTech). President of "Cercle d'Infrastructures" (Infrastructures Circle).
	Dr. Adriana Martínez	Associate Professor of Roads. Dr. Civil Engineer (BarcelonaTech). MATCAR research group.
	Dr. Francesc Robusté	Professor of Transportation. Dr. Civil Engineer (BarcelonaTech), PhD, MEng in Transportation, MSc in Operations Research (UC Berkeley). Coordinator of BIT research group.
	Dr. Elisabet Roca	Associate Professor of Sociology. Dr. Environmental Scientist (Barcelona University). EXIT research group.
	Dr. Francesc Soriguera	Associate Professor of Transportation. Dr. Civil Engineer (BarcelonaTech). Co-Director of the Master in Supply Chain, Transportation and Mobility at BarcelonaTech. BIT research group.