Imperial College London

Department of Civil and Environmental Engineering

Transport, Environmental Impacts and Safety

Course leader:	Dr Marc Stettler
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Module status:	Elective
Pre- or co-requisites:	Pre-requisite: CI3-370
Term:	Autumn
Contact hours:	30
ECTS units:	6
FHEQ Level:	7
Assessment:	Written examination and coursework

1.0 Aims

- To provide students with a thorough understanding of the principal environmental impacts and safety concerns of transport.
- To equip students with tools and techniques for evaluating air quality, noise and climate impacts of transport at local and global scales.
- To train students to understand and evaluate the principles of transport risk and safety, specifically with respect to different transport modes and human factors.

2.0 Syllabus

No.	Topic	Staff
01	Sustainability and Environmental Impact Assessment	MS
02	Climate and air pollution impact of transport emissions	MS
03	Emissions and pollution dispersion modelling	MS
04	Noise impacts of transport	MS
05	Measurement and mitigation	MS
06	Safety theory: the principles of a safety management system (SMS)	AM
07	Accident and incident investigation	AM
08	System safety and details of the SMS	AM
09	Quantified Risk Assessment. Safety culture, safety climate and safety data	AM
10	Human elements of safety	AM

3.0 Intended learning outcomes

On successfully completing this course unit, students will be able to:

- Describe the principal mechanisms by which different transport modes impact upon the environment, with specific consideration of air quality, climate and noise impacts.
- Evaluate these environmental impacts using a number of modelling tools and Environmental Impact Assessment (EIA) frameworks, and understand key impact measurement techniques.
- Understand environmental regulations on transport and describe innovations to reduce transport's environmental impacts, including emissions control technologies.
- Analyse accidents and incidents in an appropriate framework and calculate transport risk.
- Explain and evaluate human risk factors and how risks are mitigated.

4.0 Teaching methods

This module is taught through a combination of lectures, tutorials and workshops.

5.0 Assessment

Assessment information will be provided separately.

6.0 Recommended textbooks

Category as defined by Central Library:

C = Core, S = Supplementary

S	David J.C. MacKay. Sustainable Energy – Without the Hot Air. UIT Cambridge, 2008. ISBN 978-0-9544529-3-3. Available free online from www.withouthotair.com
S	Sustainable Transport: A Sourcebook for Policy Makers in Developing Cities; GTZ Sustainable Urban Transport Project. Available free (with Registration) online via www.sutp.org under "GTZ Sourcebook".
S	Sims R., R. Schaeffer, F. Creutzig, X. Cruz-Núñez, M. D'Agosto, D. Dimitriu, M.J. Figueroa Meza, L. Fulton, S. Kobayashi, O. Lah, A. McKinnon, P. Newman, M. Ouyang, J.J. Schauer, D. Sperling, and G. Tiwari, 2014: Transport. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
S	WebTAG: TAG unit A3 environmental impact appraisal, December 2015. Department for Transport. Available at: https://www.gov.uk/government/publications/webtag-tag-unit-a3-environmental-impact-appraisal-december-2015

7.0 Subject threads

The table below shows how the themes of design, sustainability and health & safety risk management are embedded in the curriculum (as defined by the JBM degree guidelines).

Key: Primary (P), Secondary (S) and Contributory (C).

Design	Health & Safety Risk Management	Sustainability
C	P	P