

CI9-T-03 Transport Engineering and Operations

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| Course leader: | Dr Bani Anvari |
| Other contributors: | Prof. Nicola Christie, Dr Taku Fujiyama, Mr Kamal Achuthan, Prof. Neil Hoose |
| Module status: | Core |
| Pre- or co-requisites: | |
| Term: | Autumn |
| Contact hours: | 30 |
| ECTS units: | 6 (MSc) |
| FHEQ Level: | 7 |
| Assessment: | Written examination |

1.0 Aims

To introduce description, analysis and modelling of elements that are relevant to transport engineering and operations. This includes basic mechanics of transport operations and implications for safety; flow of traffic on open track; queuing at points of conflict or interruption; basic operational and engineering requirements for railways; intelligent transport systems (ITS); roundabouts and priority junctions; traffic signal control; alignment and layout of highway links and free-flow junctions; public passenger transport infrastructure; road safety engineering; and transport system management including use of street space by different kinds of users for different purposes.

2.0 Syllabus

- This course provides students with an introduction to the subject of traffic and transport engineering with consideration of aspects including mobility, safety, energy, and environment.
- Lectures are supported by extensive sets of notes provided by the lecturers and containing examples for students to practise new concepts.
- During tutorials, students are encouraged to apply the material delivered in the lectures to the solution of a wide range of problems.

| Location | No. | Topic | Staff |
|----------|-------|---|-------|
| UCL | 01-02 | Basic mechanics of transport operations | BA |
| UCL | 03-04 | Fundamentals in traffic flow | BA |
| UCL | 05-06 | Mobility and queuing | BA |
| UCL | 07-08 | Safety | NC |
| UCL | 09-10 | Environment and energy | BA |
| UCL | 11-12 | Road junctions | BA |
| UCL | 13-14 | Public transport | BA |
| UCL | 15-16 | Railways | TF |
| UCL | 17-18 | Ports | KA |
| UCL | 19-20 | Intelligent transport systems | NH |

3.0 Intended learning outcomes

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

- Set out basic engineering and operational concepts that are relevant to transport, and to consider the road system and more briefly the rail systems, together with the provision of public passenger transport and use of street space, in the light of these concepts.

4.0 Teaching methods

This module is delivered through taught lectures and participation in activities. Activities include an assessed group work exercise to assimilate, process and interpret national data.

5.0 Assessment

| Assignment Title | Date Set | Date Due | Return Date | Coursework Weighting | Set by |
|---|-----------------------|-----------------------|-----------------------|----------------------|--------|
| CW1: Exercise on traffic flow and queueing | Lecture session 5-6 | Lecture session 9-10 | Lecture session 13-14 | 50% | BA |
| CW2: Exercise on junction design and public transport | Lecture session 13-14 | Lecture session 17-18 | Lecture session 19-20 | 50% | BA |

6.0 Recommended textbooks

Category as defined by Central Library:

C = Core, S = Supplementary

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| S | INSTITUTION OF HIGHWAYS AND TRANSPORTATION (1997) Transport in the Urban Environment. London: CIHT. |
| S | DAGANZO, CF (1997) Fundamentals of transportation and traffic operations. Oxford: Pergamon. |
| S | DEPARTMENT FOR TRANSPORT (2003) Urban safety management guidelines: road safety strategies for urban communities. London: DfT. |

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 |
|--------|---------------------------------|----------------|
| P | S | S |