CIVIL-351  
**Transportation systems engineering**  
Geroliminis Nikolaos

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<thead>
<tr>
<th>Cursus</th>
<th>Sem.</th>
<th>Type</th>
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<tbody>
<tr>
<td>Génie civil</td>
<td>BA5</td>
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<td>Mineur en Développement territorial et urbanisme</td>
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<tr>
<th>Language</th>
<th>Credits</th>
<th>Session</th>
<th>Semester</th>
<th>Exam</th>
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<tbody>
<tr>
<td>English</td>
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<td>Winter</td>
<td>Fall</td>
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<tr>
<th>Workload</th>
<th>Hours</th>
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<tr>
<td>120h</td>
<td>4 weekly</td>
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<td>14 Weeks</td>
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<tr>
<th>Lecture</th>
<th>Exercises</th>
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<td>3 weekly</td>
<td>1 weekly</td>
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Summary

- Introduce the major elements of transportation systems and create awareness of the broader context  
- Develop basic skills in applying the fundamentals of the transportation field  
- Understand the key concepts and physics of the transport phenomena  
- Connect with real transportation problems

Content

**Transportation Systems and Mobility:**  
Mobility - Activities - Land Use, Classification-Hierarchy, Multimodality-Urban Planning  
**Demand:**  
Demand analysis, Travel Forecasting (4-step models)  
**Modeling and Operations:**  
Basic assessment tools, Traffic flow modeling, Control and capacity of transport systems  
**Design of multimodal systems:**  
Urban Policy, Case Studies, Intro to bus operations

Learning Outcomes

By the end of the course, the student must be able to:

- Estimate how transport users choose route and mode  
- Characterize the level of service of a transport system  
- Assess / Evaluate traffic signal performance  
- Model traffic flow propagation  
- Identify the most appropriate strategy to alleviate congestion

Transversal skills

- Plan and carry out activities in a way which makes optimal use of available time and other resources.  
- Use a work methodology appropriate to the task.  
- Communicate effectively, being understood, including across different languages and cultures.  
- Evaluate one's own performance in the team, receive and respond appropriately to feedback.  
- Identify the different roles that are involved in well-functioning teams and assume different roles, including leadership roles.  
- Respect relevant legal guidelines and ethical codes for the profession.  
- Continue to work through difficulties or initial failure to find optimal solutions.

Teaching methods
Ex-cathedra with assisted exercises, course group projects

Assessment methods
Midterm 30%
Final Exam 40%
Laboratories 30%

Resources
Bibliography
Lecture notes, book chapters and handouts will be distributed throughout the semester, or posted on web.

Prerequisite for
Master classes in Transportation