Subject Description Form

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>CSE561</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject Title</td>
<td>Public Transport Operations and Service Planning</td>
</tr>
<tr>
<td>Credit Value</td>
<td>3</td>
</tr>
<tr>
<td>Level</td>
<td>5</td>
</tr>
</tbody>
</table>

Pre-requisite / Co-requisite/ Exclusion

Recommended background knowledge:
It is expected that students will have a fundamental understanding of mathematics and physics consistent with undergraduate level study in civil engineering.

Objectives

1. To present innovative methods and advance technologies which have significant potential for improving the cost–effectiveness of public transport planning.
2. To compare between traditional operations and service planning, including scheduling procedures, and system analysis approaches, which are now beginning to be applied for improvements of public transport operations.
3. To deal with and to find solutions for persistent and realistic public transport problems.

Intended Learning Outcomes

Upon completion of the subject, students will be able:

a. to understand the public transport planning inputs and data required for transit line headway determination and timetable development;

b. to utilize mathematical models and computer tools for predicting passenger demands and assessing the impacts of alternative public transport improvement measures;

c. to apply optimization and analytical techniques for resource allocation and transit network design problems; and

d. to exercise professional judgement and engineering sense in design and evaluation of public transport improvement measures.

Subject Synopsis/ Indicative Syllabus

Keyword Syllabus

i) Overall Framework
Public transport operations and planning process; tradeoffs between services; standard versus mini-vehicle; public transport planning studies; transit modes and technologies.

ii) Data Collection Methods
Manual and automated data collection techniques; automatic vehicle monitoring; sampling considerations; operations surveys: passenger load counts, boarding and alighting checks, transit speed and delay studies.

iii) Frequency and Headway Determination
Analyzing passenger load and running time data; four methods for frequency and headway determination; examples of the four methods; cost-effectiveness criteria.

iv) Timetable Development
Current practice; alternative timetables; timetables with evenly spaced headways; timetables with even loads; automated timetables with examples.

Teaching/Learning Methodology

The underlying principles and techniques relating to public transport planning will be dealt with in lectures. However, it is important that the students are exposed to the interdependence between theories and practice in public transport planning. Students will therefore be required to attempt exercises in the tutorials in order to understand the associated techniques in practice. Individual assignments will consist of numerical problems on public transport planning, while computer laboratory sessions will be held to demonstrate the applications of mathematical models and to provide opportunity for students to appreciate the difference between manual calculation and computer modeling. Professionals from government or industry will also be invited to give lectures on current issues of public transport planning in Hong Kong.

Assessment Methods in Alignment with Intended Learning Outcomes

<table>
<thead>
<tr>
<th>Specific assessment methods/tasks</th>
<th>% weighing</th>
<th>Intended subject learning outcomes to be assessed (Please tick as appropriate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Continuous Assessment</td>
<td>40%</td>
<td>a. b. c. d.</td>
</tr>
<tr>
<td>2. Written Examination</td>
<td>60%</td>
<td>√ √ √ √</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes.
Continuous assessment will be based on coursework and case study discussions. Written examination is evaluated by final examination. Students must attain at least Grade D in both coursework and final examination (whenever applicable) in order to attain a passing grade in the overall result.

<table>
<thead>
<tr>
<th>Reading List and References</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Textbooks</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Reference Books</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Conference Proceedings and Symposia</strong></td>
<td></td>
</tr>
</tbody>
</table>
| Proceedings of the HKSTS Conferences - Hong Kong Society for Transportation Studies ([www.hksts.org](http://www.hksts.org))  
| **Journals**                |  
| Accident Analysis and Prevention  
| Bus and Coach Management  
| Journal of Advanced Transportation  
| Journal of the Transportation Research Board  
| Journal of Transportation Engineering, the American Society of Civil Engineers  
| The journal – Public Transport: Planning and Operations |  
| **Reports**                 |  
| Technical reports by the Traffic and Transport Survey Division, Hong Kong Government  
| Transportation Research Records, Transportation Research Board  
| Transport Planning and Design Manual, Hong Kong Transport Department  
| TRRL reports, Transport and Road Research Laboratory |