SHORT COURSE DESCRIPTION

Systems theory and analysis. Urban data, metrics, indicators and simulation. Policy scenario analysis. Demand-side planning: population and demand modeling; demand management. Supply-side planning: long term infrastructure investment and planning, strategic management. This course is not eligible for Credit/D/Fail grading.

COURSE GOALS

This course explores theoretical frameworks and quantitative methods for urban infrastructure systems analysis and planning. This course focuses on a major group project implementation and evaluation (“the Project Simulator”) using data driven scenario analysis and modelling to devise and plan alternative future infrastructure investment strategies for a city-wide case-study.

This is a required course of the Urban Systems Pillar in the Masters of Engineering Leadership program. The course is organized around four major themes: (i) Infrastructure and the development of cities, (ii) Services and impacts, (iii) The role of government and institutions and, (iii) Urban futures. Each of these topics will be studied within a strategic planning context, and with the goal of preparing you to address these issues in professional practice.

COURSE FORMAT

This course is delivered through lectures, readings, class discussions and focuses on a major group project implementation and evaluation.

LEARNING OBJECTIVES

After completing this course, students will be able to:

- Apply systems theory and quantitative methods including data driven scenario analysis, modelling and multi-attribute (economic and environmental) impact assessment;
- Analyze macro level drivers and impacts on infrastructure service demand and capacity including population, demographics, macroeconomics, environment and climate change;
- Develop cross-sector and sector specific (energy, transport, water, solid waste, ICT) infrastructure performance metrics;
- Implement team work, leadership and project management skills acquired from Sauder platform courses;
- Provide effective, timely and constructive feedback on project milestones/deliverables to project teams;
- Communicate results effectively to a stakeholder/public audience.
URSY 520: Urban Systems Analysis & Planning

COURSE INFORMATION

Division: School of Community & Regional Planning  
Period: Term 2 – Winter 2017

Instructor: Martino Tran  
Course dates: January 3 – April 6, 2018

Email: martino.tran@ubc.ca  
Final exam: None

Phone: 604 617 5492  
Class meeting times: By appointment

Office hours: By Appointment  
Class location: Room 326 – Jack Bell

READING MATERIALS

Required Reading and Videos

Text (not mandatory):


Recommended Readings


EVALUATION CRITERIA AND GRADING

The course is graded on a numeric percentage with 60% constituting a pass.

Grading breakdown:

- Project Report 50%
- Project Evaluation 30%
- Project Communication 20%

ATTENDANCE

Students are expected to attend all class sessions and participate.
### CLASS SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Urban systems challenges and opportunities</td>
</tr>
<tr>
<td>2</td>
<td>Scenario analysis and long-range planning methods</td>
</tr>
<tr>
<td>3</td>
<td>Systems theory, analysis and engineering</td>
</tr>
<tr>
<td>4</td>
<td>Integrated assessment modelling</td>
</tr>
<tr>
<td>5</td>
<td>Urban data and metrics</td>
</tr>
<tr>
<td>6</td>
<td>Population and demand modelling</td>
</tr>
<tr>
<td>7</td>
<td>Model building exercises</td>
</tr>
<tr>
<td>8</td>
<td>Transport infrastructure systems</td>
</tr>
<tr>
<td>9</td>
<td>Energy infrastructure systems</td>
</tr>
<tr>
<td>10</td>
<td>Water infrastructure systems</td>
</tr>
<tr>
<td>11</td>
<td>Smart Cities</td>
</tr>
<tr>
<td>12</td>
<td>Final projects &amp; evaluation</td>
</tr>
</tbody>
</table>

### Academic Integrity

The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, or mislead others about what is your work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. For example, incidences of plagiarism or cheating may result in a mark of zero on the assignment or exam and more serious consequences may apply if the matter is referred to the President’s Advisory Committee on Student Discipline. Careful records are kept in order to monitor and prevent recurrences.

A more detailed description of academic integrity, including the University’s policies and procedures, may be found in the Academic Calendar at http://calendar.ubc.ca/vancouver/index.cfm?tree=3,54,111,0.