CDE3504 Smart Cities

(AY25/26 Semester 1)

Updated as of 3 July 2025

Course Overview

This course on Smart Cities is about designing smart, innovative, sustainable solutions to create a competitive economy, which is one of the key quality-of-life indicators. Here, we focus on Singapore, known to be one of the smartest cities in the world[1] and appreciate how Singapore tackled its urban challenges specifically in the area of economic and urban development. Case studies from the Urban Systems Studies (USSs) of Singapore[2] written by the Centre for Liveable Cities (CLC) will form the basis of this course. While we focus on Singapore, we will also learn from the experiences of other smart cities from around the world.

The course will delve deeper into the Liveability Outcomes of Competitive Economy, in the CLC Liveability Framework (LF) and how this (particular) outcome is achieved, as narrated through the USSs literatures. We will learn about how various sectors of economy were developed by leveraging technology to achieve this outcome. These sectors include the maritime industry, manufacturing, tourism, and knowledge-based economy. Additionally, we will gain an understanding of the financing of smart city initiatives, along with an examination of several international case studies.

In this course, co-curricular learning is equally emphasized. Students will engage in an experiential learning journey, which involves working collaboratively in your teams as you gain practical, hands-on experience in tackling real-world challenges in a simulated work environment. Remember, your education in the university is not just about learning academic contents; it's about preparing you for the real world[1], where these "soft" skills are invaluable for success in any profession. Embrace team-based learning as a chance to grow personally and professionally, in preparation for your future career!

[1] https://www.straitstimes.com/singapore/singapore-is-top-asian-city-in-smart-city-index-ranks-7th-worldwide
[2]https://knowledgehub.clc.gov.sg/publications/?filters=%5B%7B%22id%22%3A%22category%22%2C%22items%22%3A%5B%7B%22id%22%3A%22urban+systems+studies%22%7D%5D%7D%5D&page=1

Course Learning Objectives

1. Able to apply a systematic approach to identify challenges and consider holistic impact of solution on social, environment and economy.
2. Able to propose creative solutions aimed at achieving or supporting a competitive economy as an outcome of the Liveability Framework
3. Able to evaluate the effectiveness of solutions using decision making tools.

Course Leaders

Dr. Kevin Kuang, Associate Professor, Department of Civil and Environmental Engineering, CDE, NUS (ceeksck@nus.edu.sg)

Ms. Koh Choon Fah, Adjunct Practice Professor, NUS Cities; Former CEO, Edmund Tie & Company (SEA) Pte Ltd (cfkoh@nus.edu.sg)

Teaching Assistant

Ms. Chenyu Zan, Senior Associate (Research Assistant), NUS Cities (zan_cy@nus.edu.sg)

Course Schedule

Lecture Venue : E1-06-07 **| Studio Venue :** E1-06-07

Time: 10:00am – 1:00pm every Tuesday

(except for Week 2 – 9:00am – 2:00pm on Saturday for the UrbanPlan workshop)

Attendance for seminars and studios is **compulsory**.

All resources, videos, readings, guides, deadlines, expectations etc. are in Canvas

<table>
<tr><th>Date</th><th colspan="2">Schedule</th><th>Venues</th></tr>
<tr><td>Week 1
12 Aug
Tuesday</td><td colspan="2">Lecture 1 Course Introduction
From Liveable Cities to Smart Cities
Creating an innovative and competitive economy</td><td>E1-06-07</td></tr>
<tr><td>Week 2
23 Aug
Saturday</td><td colspan="2">Urban Plan Workshop
[Saturday, 9:00am – 2:00pm]</td><td>SDE3
Barrel Room</td></tr>
<tr><td rowspan="2">Week 3
26 Aug
Tuesday</td><td>10:00am – 11:15am</td><td>11:15am – 1:00pm</td><td rowspan="2">E1-06-07</td></tr>
<tr><td>Studio 0
Project Planning Template
Exploring Urban Problems</td><td>Guest Panel 1:
Port and the City
TBC</td></tr>
<tr><td>Week 4
2 Sept
Tuesday</td><td colspan="2">Studio 1 Field Trip
Punggol Digital District (PDD)</td><td></td></tr>
<tr><td>Week 5
9 Sept
Tuesday</td><td colspan="2">Studio 2 Preparation for Proposal
Articulate Challenge Statement, Set Objectives</td><td>E1-06-07</td></tr>
<tr><td>Week 6
16 Sept
Tuesday</td><td colspan="2">Studio 3 Interim Group Presentation
Oral presentation with slides
(Poster to submit to CANVAS)</td><td>E1-06-07</td></tr>
<tr><td colspan="4">Recess Week (22 Sept – 26 Sept)</td></tr>
<tr><td>Week 7
30 Sept
Tuesday</td><td colspan="2">Lecture 2
Financial & Decision-making Tools (MCDM, CBA, Leopold Matrix)
to Evaluate a Smart City Initiative</td><td>E1-06-07</td></tr>
<tr><td rowspan="2">Week 8
7 Oct
Tuesday</td><td>10:00am – 11:15am</td><td>11:15am – 1:00pm</td><td rowspan="2">E1-06-07</td></tr>
<tr><td>Studio 4
Generate 3 Solutions</td><td>Guest Panel 2:
Financing a City and Working with Markets
Colin and Sunny Tsun</td></tr>
<tr><td>Week 9</td><td>10:00am – 11:15am</td><td>11:15am – 1:00pm</td><td>E1-06-07</td></tr>
</table>

14 Oct Tuesday	**Studio 5** *Use Decision-making Tools and Decide on Best Solution*		
Week 10 21 Oct Tuesday	NUS WELL BEING DAY NO CLASS TODAY		E1-06-07
Week 11 28 Oct Tueday	**Studio 6** *Finalise Best Solution and Consolidate Project*	**Guest Panel 3** **Sustainability & International Case Studies** Nina	E1-06-07
Week 12 4 Nov Tuesday	**Studio 7 + Quiz** *Preparation for Final Presentation*		E1-06-07
Week 13 11 Nov Tuesday	**Studio 8** *Final Group Presentation* Oral presentation with slides		E1-06-07

** *There may be slight changes to the guest speakers. All updates will be announced on Canvas.*

Course Assessment

1. **Group** Components (60%)
   Team Project comprising
   i. UrbanPlan Workshop participation – 10% (to participate @ Week 2)
   ii. Field Trip Report – 5% (start any time, due end of Week 4)
   iii. Interim Poster – 20% (due end of Week 6)
   iv. Oral presentation with slides & video – 25% (@ Week 13)

2. **Individual** Components (40%)
   i. Attendance (compulsory) - absence without valid reason (e.g. without an MC) penalty: 5% deducted from overall marks
   ii. Contribution / Participation in teamwork – 10%
   iii. Reflection Write-up – 10% (due end of Week 13)
   iv. Quiz – 20% (@ Week 12)