

CDE3504 Smart Cities

(AY24/25 Semester 1)

Updated as of 3 July 2024

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://www.clc.gov.sg/research-publications/publications/urban-systems-studies>

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. Joy Heng, Associate (Teaching Assistant), NUS Cities (joyheng@nus.edu.sg)

Course Schedule

Lecture Venue : LT7A | **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)

Date	Schedule
Week 1 13 Aug	Lecture 1 Introduction to Smart Cities
Week 2 24 Aug	Urban Plan Workshop [Saturday, 9:00am – 2:00pm] <i>*compulsory and in lieu of Tuesday</i>
Week 3 27 Aug	Guest Panel 1 + Studio 0 Project Planning Template Exploring Urban Problems, Articulate Challenge Statement & Define Project Objectives
Week 4 3 Sept	Field Trip to Punggol Digital District
Week 5 10 Sept	Studio 1 Preparation for Proposal
Week 6 17 Sept	Studio 2 Submit poster and oral presentation to pitch proposal
Recess Week	
Week 7 1 Oct	Lecture 2 Financial & Decision-Making Tools to Evaluate a Smart City Initiative
Week 8 8 Oct	Guest Panel 2 + Studio 3 Generate 3 Solutions
Week 9 15 Oct	Lecture 3 + Studio 4 Sustainability & Impact on S.E.E. Solutions and Decision-making
Week 10 22 Oct	Guest Panel 3 + Studio 5 Evaluate Impact on S.E.E.
Week 11 29 Oct	Studio 6 Finalise Best Solution and Consolidate Project
Week 12 5 Nov	Studio 7 + Quiz Preparation for Final Presentation
Week 13 12 Nov	Final Group Presentation

**The course schedule is tentative and subjected to final changes if any.*

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)