

SYE2339: SMART CITY - A SYSTEMS ENGINEERING PERSPECTIVE

Effective Term

Semester A 2024/25

Part I Course Overview

Course Title

Smart City - a Systems Engineering Perspective

Subject Code

SYE - Systems Engineering

Course Number

2339

Academic Unit

Systems Engineering (SYE)

College/School

College of Engineering (EG)

Course Duration

One Semester

Credit Units

3

Level

B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

ADSE2339 Smart City - a Systems Engineering Perspective

Exclusive Courses

GE2339 Smart City - a Systems Engineering Perspective

Part II Course Details

Abstract

The 21st century is an era of internet, information and data. This course aims to explore its implication and opportunity for development of smart city and industry, in Hong Kong and the region. We will investigate this from a systems engineering perspective in which emphasis will be placed smart city development, the use of sensors, system design and development, internet of things (IoT), data analytics and visualisation, and intelligent manufacturing. Students will learn about how these skills are influencing and shaping urban development. This course will help students to understand better the roles of systems engineers in today's information era, and to recognize the importance intelligent systems in the modern world. Students' learning in this course will be based on cases presented throughout the course. Students will also work on their own smart city project by building a prototype smart city (IoT) solution. Furthermore, student's learning will be enriched by company visits and/or guest lectures from the industrial engineering and management professionals and eminent professors.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Elaborate on the implications of internet, information, technology and data on the development of smart city and intelligent manufacturing	30	x	x	
2	Apply and interpret data tools for smart city solutions; tools include mobile applications, machine learning, IoT, and sensor technology	20		x	
3	Discuss issues of ethics and privacy within smart city development	10	x		
4	Produce a prototype of an effective smart solution and communicate clearly the results the assignments	30		x	x
5	Recognise how data-driven and smart solutions can be used to drive innovative thinking in modern enterprise management	10	x		

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

LTAs	Brief Description	CILO No.	Hours/week (if applicable)	
1	Large class activity	Weekly lectures with group discussion.	1, 3, 5	2 hrs/week
2	Small group laboratory	Lab (computer) sessions for discussion of cases, constructing smart city prototypes, applying data analytics and presenting case results.	1, 2, 4, 5	2 hrs/week

3	Out-of-classroom activity	Complementary out-of-class activities (such as lab facility visits) will be organized	3, 5	
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Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	First project component Theme: programming, smart city and data understanding	2, 5	25	
2	Second project component Theme: development of smart city and/or smart industry prototype solution	1, 3, 4	25	

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Additional Information for ATs

To pass the final exam, students must get 40 points out of 100 or higher.

If one or more of the above criteria are not met, the student will receive an overall grade F (fail) for the whole course.

Assessment Rubrics (AR)**Assessment Task**

Project

Criterion

Group participation, oral presentation and written work

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

Final exam

Criterion

Subject matter understanding

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

- Smart city and smart industry
- IoT, system design
- Data visualization, block-based programming
- Modern industrial and enterprise management
- Systems engineering and engineering management
- Data driven and innovative thinking

Reading List

Compulsory Readings

Title	
1	(To be announced on Canvas)

Additional Readings

Title	
1	(To be announced on Canvas)