City University of Hong Kong
Course Syllabus

offered by Department of Information Systems
with effect from Semester A 2022 / 2023

Part I   Course Overview

Course Title: Design Science and Empirical Research in Information Systems

Course Code: IS8006

Course Duration: One Semester (13 weeks)

Credit Units: 3

Level: R8

**Medium of
Instruction:**   English

**Medium of
Assessment:**   English

Prerequisites:
(Course Code and Title)   Nil

Precursors:
(Course Code and Title)   Nil

Equivalent Courses:
(Course Code and Title)   IS8006M Design Science and Empirical Research in Information Systems

Exclusive Courses:
(Course Code and Title)   Nil

Part II   Course Details

1.   Abstract

This course introduces technical research methodologies in IS in two parts.

The first half of the class is to assist students understand the typical research methodologies found in the IS design research areas including information modelling, algorithm and framework design, design theory, design science supported empirical analysis, among others.

The second half of the course covers empirical research strategies for causal inference. We will specifically examine the discovery, analysis, and evaluation of naturally-occurring experiments. We will introduce, explain, and illustrate different causal inference strategies including naturally-occurring randomized experiments, instrumental-variable designs, and regression-discontinuity designs.

2.   Course Intended Learning Outcomes (CILOs)

No.	CILOs	Weighting	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Explain the nature of contemporary design science research in IS.	20%	✓		
2.	Evaluate and critique the current design science research directions in IS.	20%	✓	✓	
3.	Understand a variety of causal inference methods for empirical research.	20%	✓	✓	
4.	Implement a variety of causal inference research designs for IS research	20%	✓	✓	
5.	Develop design science or empirical research proposals following suitable research methodologies	20%	✓	✓	
		100%			

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 self-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.

3. Teaching and Learning Activities (TLAs)

TLA	Brief Description	CILO No.						Hours/week (if applicable)
		1	2	3	4			
TLA1: Seminar	The following items form the content of the lecture: 1. Introduction of design science research frameworks 2. Overview of current areas of design science research 3. Evaluation and critique of sample work in design science research from top IS journals 4. Introduction to a variety of causal inference methods for empirical research 5. Evaluation and critique of sample work of empirical research from premium business and economics journals	✓	✓	✓	✓			

4. Assessment Tasks/Activities (ATs)

Assessment Tasks/Activities	CILO No.						Weighting	Remarks
	1	2	3	4				
Continuous Assessment: __100__ %								
AT1. Discussion and Participation The lecture consists of discussions to assess students' understanding of the chosen research areas. Each student is expected to show their abilities through the discussions.	✓	✓	✓	✓			40%	
AT2. Literature Presentation Each student is required to conduct extensive literature review in the chosen areas. Each student is required to give presentations of selected readings	✓	✓	✓	✓			30%	
AT3. Proposal Presentation Each student is required to develop a research design and give presentations of the design, which demonstrate his/her ability in solving problems in a particular research area.	✓	✓	✓	✓			30%	
							100%	

5. Assessment Rubrics

Applicable to students admitted in Semester A 2022/23 and thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
AT1. Discussion and Participation	Ability to explain the nature of contemporary design science research in IS.	High	Significant	Moderate	Not even reaching marginal levels
	Ability to understand a variety of causal inference methods for empirical research.	High	Significant	Moderate	Not even reaching marginal levels
AT2. Literature Presentation	Ability to evaluate and critique the current design science research directions in IS.	High	Significant	Moderate	Not even reaching marginal levels
	Ability to evaluate and make causal inference research designs for IS research	High	Significant	Moderate	Not even reaching marginal levels
AT3. Proposal Presentation	Ability to apply appropriate methodologies to solve design science research problems.	High	Significant	Moderate	Not even reaching marginal levels
	Ability to apply appropriate causal inference methodologies to solve empirical problems.	High	Significant	Moderate	Not even reaching marginal levels
	Capability to.develop comprehensive design science or empirical research proposals following suitable research methodologies.	High	Significant	Moderate	Not even reaching marginal levels

Applicable to students admitted before Semester A 2022/23

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
AT1. Discussion and Participation	Ability to explain the nature of contemporary design science research in IS.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to understand a variety of causal inference methods for empirical research.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT2. Literature Presentation	Ability to evaluate and critique the current design science research directions in IS.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to evaluate and make causal inference research designs for IS research	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT3. Proposal Presentation	Ability to apply appropriate methodologies to solve design science research problems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Ability to apply appropriate causal inference methodologies to solve empirical problems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to.develop comprehensive design science or empirical research proposals following suitable research methodologies.	High	Significant	Moderate	Basic	Not even reaching marginal levels

Part III   Other Information

1.   Keyword Syllabus

1.   Design Science: evolution and status of design science research; nature and characteristics of design science research; research frameworks for design science research; areas of current design science research; characteristics of good design science research.

2.   Empirical Research: the potential outcome framework, randomized experiments, linear regression, instrumental variable designs, regression discontinuity designs, difference-in-differences.

2.   Reading List
2.1   Compulsory Readings

1.	Classic and recent papers from top journals, which will be selected and provided in the class.

2.2   Additional Readings

1.	Nil