City University of Hong Kong
Course Syllabus

offered by School of Data Science
with effect from Semester A 2024/25

Part I   Course Overview

Course Title:	Networked Life and Data Science
Course Code:	SDSC6014
Course Duration:	One semester
Credit Units:	3
Level:	P6
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)*	Nil
Exclusive Courses: *(Course Code and Title)*	Nil

Part II   Course Details

1.   **Abstract**

This course covers fundamental techniques behind everyday networked applications and services used by millions of people worldwide, including Google search, YouTube, Cellular service, and Blockchain. These techniques include, but not limited to, optimization, algorithm, security, data analytics, and machine learning. How data science and related subject enables and enhance these essential networked applications and services will also be discussed.

2.   **Course Intended Learning Outcomes (CILOs)**
(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs	Weighting (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Describe the fundamentals of exemplary networked applications and services	30%	✓		
2.	Describe how data science may enable and enhance these applications and services	30%	✓		
3.	Compare and analyze different techniques behind these applications and services	20%	✓	✓	
4.	Apply key analysis and techniques to solve practical problems	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. Learning and Teaching Activities (LTAs)
(LTAs designed to facilitate students' achievement of the CILOs.)

LTA	Brief Description	CILO No.					Hours/week (if applicable)
		1	2	3	4		
Lecture	Students will engage in formal lectures to gain knowledge about various networked applications in daily life and the fundamental challenges and data-science related solutions behind	✓	✓	✓	✓		27-30 hours in total
Class-project	The students will identify and tackle practical problems in networked systems, ideally with data science related techniques learned from the course. The students will write a report and give two presentations. This learning activity will be mainly student-led but with the instructor's structural guidance.	✓	✓	✓	✓		9-12 hours for in-class presentation and final presentation, as well as after-class project activities

4. Assessment Tasks/Activities (ATs)
(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.					Weighting	Remarks
	1	2	3	4			
Continuous Assessment: __100__ %							
<u>Paper Reading, Quizzes, or Homework</u> Review reports of selected papers will show how well the students can understand the concepts, fundamentals, and techniques of networked application and services, as well as the role of data engineering. Quiz or homework questions are designed to see how well the students have mastered the concepts, fundamentals, and techniques of networked services, as well as data engineering.	✓	✓				25%	Up to 5 papers or homework will be assigned or two quiz problems per lecture will be assigned.
<u>Test</u> Questions are designed to see how well the students have learned the basic concepts, fundamental, techniques of networked application and services, and data engineering.	✓	✓	✓			25%	
<u>Mini-Project</u> The project provides students chances to demonstrate the understanding and application of the basic concepts, fundamentals, and techniques of networked application and services and data engineering in practical systems.	✓	✓	✓	✓		25%	
<u>Mini-Project Presentation</u> The project provides students chances to demonstrate how well they have achieved their intended learning outcomes.	✓	✓	✓	✓		25%	
						100%	

5. Assessment Rubrics
(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Applicable to students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Paper Reading	Ability to understand and the basic concepts, fundamentals, and techniques of networked application and services, as well as the role of data engineering.	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Test	Ability to understand and apply the basic concepts, fundamentals, and techniques of networked application and services, as well as the role of data engineering.	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Mini-Project Report	Ability to demonstrate the understanding and application of the basic concepts, fundamentals, and techniques of networked application and services and data engineering in practical systems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
4. Mini-Project Presentation	Ability to demonstrate how well the intended learning outcomes are achieved.	High	Significant	Moderate	Basic	Not even reaching marginal levels

Applicable to students admitted from Semester A 2022/23 to Summer Term 2024

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
1. Paper Reading	Ability to understand and the basic concepts, fundamentals, and techniques of networked application and services, as well as the role of data engineering.	High	Significant	Basic to moderate	Not even reaching marginal levels
2. Test	Ability to understand and apply the basic concepts, fundamentals, and techniques of networked application and services, as well as the role of data engineering.	High	Significant	Basic to moderate	Not even reaching marginal levels
3. Mini-Project Report	Ability to demonstrate the understanding and application of the basic concepts, fundamentals, and techniques of networked application and services and data engineering in practical systems.	High	Significant	Basic to moderate	Not even reaching marginal levels
4. Mini-Project Presentation	Ability to demonstrate how well the intended learning outcomes are achieved.	High	Significant	Basic to moderate	Not even reaching marginal levels

Part III   Other Information (more details can be provided separately in the teaching plan)

1.   **Keyword Syllabus**
      (An indication of the key topics of the course.)

      Networks, data analytics, machine learning, optimization, data engineering

2.   **Reading List**
2.1   **Compulsory Readings**
      (Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Mung Chiang, "Networked Life: 20 Questions and Answers", Cambridge University Press, 2012

2.2   **Additional Readings**
      (Additional references for students to learn to expand their knowledge about the subject.)

1.	Satoshi Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System", 2008