City University of Hong Kong
Course Syllabus

offered by Department of Media and Communication
with effect from Semester A 2022 / 23

Part I Course Overview

Course Title: Computational Social Science Methods

Course Code: COM8010

Course Duration: One semester

Credit Units: 3

Level: R8

Medium of Instruction: English

Medium of Assessment: English

Prerequisites: *(Course Code and Title)* COM8005 Quantitative Research Methods or equivalent

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

(A 150-word description about the course)

This course provides students with an extensive exposure to the fundamental principles and essential techniques of computational social science methods, ranging from automatic collection of digital and online data to machine learning with or without human supervision. The methods are intended to complement and enhance the traditional social science methods of data collection and analysis, such as survey, experiment, content analysis, and statistical analysis. Topics include opportunities and challenges for computational social science research in the digital age, descriptive/predictive vs. explanatory research, found data versus made data, research design, causal inference, sampling of social media, online experiment, behavioural analytics, text mining, and online research ethics. The course is useful for students who are interested in using computational methods for social, cultural, business, legal, and other areas of research.

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.	Explain clearly fundamental principles and essential methods of computational social science (CSS)	20%	√		
2.	Evaluate the validity, reliability and practicality of CSS methods	20%	√	√	
3.	Design new CSS studies to improve weaknesses in the existing studies	30%	√	√	√
4.	Apply appropriate CSS methods to solve given practical problems	30%	√	√	√
** If weighting is assigned to CILOs, they should add up to 100%.*		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)

(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.				Hours/week (if applicable)
		1	2	3	4	
Lecture	Learning through teaching is primarily based on lectures.	√	√	√	√	39 hours in total
Case studies	Describe and critique benchmark cases of computational social science.	√	√	√		in or after class
Hands-on assignments	Learning through in-class or take-home assignments is primarily based on hands-on exercises.		√	√	√	in or after class
Research project	Design an independent study by applying computational social science methods to a research question of theoretical and/or practical importance, with integration with traditional methods encouraged.		√	√	√	after class

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		
Class discussions	√	√	√		20%	Questions are designed for the first part of computational social science to see how well the students have learned the fundamental concepts and methods, and applications to real world context.
Hands-in assignments		√	√	√	30%	These are skill-based assessment to enable students to demonstrate the basic concepts, methods and algorithms of computational social science, and applications of computational social science in some applications.
Research paper		√	√	√	50%	Assessment of the paper will be based on the validity, reliability, and originality of the research design and the accuracy and clarity of the resulting paper.
**The weightings should add up to 100%.*					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 in Semester A 2022/23 and thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
1. Class discussions	Ability to understand and apply key concepts and methods of computational social science and articulation of problems of and solutions to dilemmas in computational social science research.	Actively participate in the lecture sessions and initiate discussion with the instructor	Attend all the lecture sessions	Attend most of the lecture sessions	Do not attend the lecture sessions
2. Hands-on assignments	Ability to demonstrate knowledge and skills of basic procedure, methods and techniques of computational social science, and design relevant studies for real world applications.	Fully complete all the tutorial tasks and actively seek knowledge outside class	Fully complete all the tutorial tasks	Able to complete the basic tutorial tasks only	Fail to hand in tutorial tasks
3. Research paper	Ability to design an innovative and practicable study on an important issue in social science research, collect, integrate and analyse relevant data, and present the results in concise and assessible ways.	Demonstrate creativity in applying knowledge learnt in class and outside class	Able to apply knowledge learnt in the class to the project	Able to deliver a project with some computational elements	Fail to use the knowledge taught in the course in the project

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)
1. Class discussions	Ability to understand and apply key concepts and methods of computational social science and articulation of problems of and solutions	High	Significant	Moderate	Basic	Not even reaching marginal levels

	to dilemmas in computational social science research.					
2. Hands-in assignments (hands-on?)	Ability to demonstrate knowledge and skills of basic procedure, methods and techniques of computational social science, and design relevant studies for real world applications.	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Research paper	Ability to design an innovative and practicable study on an important issue in social science research, collect, integrate and analyse relevant data, and present the results in concise and assessible ways.	High	Significant	Moderate	Basic	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.)

Characteristics of computational social science, descriptive research, predictive research, explanatory research, "found" data, "made" data, causal inference, sampling of social media, research design, online experiment, behaviour analytics, text mining, data integration, research ethics in social research

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.	Cioffi-Revilla, C. (2017). *Introduction to computational social science: Principles and applications*, *2nd ed.* Springer.
2.	Salganik, M. (2018). *Bit by bit: Social research in the digital age.* Princeton University Press.
3.	Ackland, R. (2013). *Web social science: Concepts, data and tools for social scientists in the digital age*. Sage.

2.2 Additional Readings

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

1.	Lazer, D., Pentland, A. S., Adamic, L., Aral, S., Barabasi, A. L., Brewer, D., ... & Jebara, T. (2009). Life in the network: the coming age of computational social science. *Science (New York, NY)*, *323*(5915), 721.
2.	Watts, D. J. (2013). Computational social science: Exciting progress and future directions. *The Bridge on Frontiers of Engineering*, *43*(4), 5-10.
3.	Golder, S. A., & Macy, M. W. (2014). Digital footprints: Opportunities and challenges for online social research. *Annual Review of Sociology*, *40*, 129-152.
4.	Shah, D. V., Cappella, J. N., & Neuman, W. R. (2015). Big data, digital media, and computational social science: Possibilities and perils. *The ANNALS of the American Academy of Political and Social Science*, *659*(1), 6-13.
5.	Ackland, R., & Zhu, J. J. (2015). Social network analysis. In *Innovations in digital research methods*. SAGE Publications.
6.	Liang, H., & Zhu, J. J. H. (2017). Big data, collection of (social media, harvesting). In J. Matthes, C. S. Davis, & R. F. Potter (Eds.), *International Handbook of Communication Methods,* Wiley & Sons.