City University of Hong Kong
Course Syllabus

offered by Department of Media and Communication
with effect from Semester A 2019/20

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

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)

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%	√	√	√
		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	
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)

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.
					100%	

5. Assessment Rubrics

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 to dilemmas in computational social science research.	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Hands-in 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.	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

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

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

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.