

**City University of Hong Kong  
Course Syllabus**

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

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**Part I Course Overview**

<b>Course Title:</b>	Advanced Research Frameworks in Information Systems
<b>Course Code:</b>	IS8010
<b>Course Duration:</b>	One Semester
<b>Credit Units:</b>	1
<b>Level:</b>	R8
<b>Medium of Instruction:</b>	English
<b>Medium of Assessment:</b>	English
<b>Prerequisites:</b> <i>(Course Code and Title)</i>	Nil
<b>Precursors:</b> <i>(Course Code and Title)</i>	Nil
<b>Equivalent Courses:</b> <i>(Course Code and Title)</i>	Nil
<b>Exclusive Courses:</b> <i>(Course Code and Title)</i>	Nil

## Part II Course Details

### 1. Abstract

This is a short course that equips research students with a specific research framework or methodology in information systems through a short, but intensive set of learning activities. The course focuses on special methodologies, which are not normally covered in regular research methodology courses available at City University. Students are expected to learn the framework or methodology and immediately apply it in a research context, typically through the write-up of a research article or discussion paper.

### 2. Course Intended Learning Outcomes (CILOs)

No.	CILOs	Weighting	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	Acquire knowledge about a specific IS research framework or methodology	20%			
2.	Develop an understanding of the direction and theories of the IS research framework or methodology	20%			
3.	Apply the IS research framework or methodology to solve IS research problem	30%	✓	✓	
4.	Demonstrate the ability to develop comprehensive research article or discussion paper following the research methodology	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	
TLA1: Seminar	<p>The following items form the content of the lecture:</p> <ol style="list-style-type: none"> <li>1. Overview of emerging topics, gaps and opportunities of IS research using a specific research framework or methodology.</li> <li>2. IS research process examination covering specialized topics in areas comprising, but not limited to, theory building, measurement, sampling, research design, survey research, experimental research, qualitative research, quantitative research, etc.</li> <li>3. Detailed examination and critique of some typical IS research work in the specific framework or methodology.</li> </ol> <p>Participants are required to engage actively discussion sessions during each seminar.</p>	✓	✓	✓	✓	

### 4. Assessment Tasks/Activities (ATs)

Assessment Tasks/Activities	CILO No.				Weighting	Remarks
	1	2	3	4		
<b>Continuous Assessment: 100 %</b>						
<p><b><u>AT1. Discussion and Participation (30%):</u></b> The seminar consists of exercises and small group discussions to assess students' understanding of the chosen research framework or methodology and their abilities to apply the framework or methodology.</p>	✓	✓	✓	✓	30%	
<p><b><u>AT2. Critical Analysis (30%):</u></b> Each student is required to present a critical analysis of the specific framework or methodology which demonstrates his/her ability in understanding the specific framework or methodology, and apply it in a research context.</p>	✓	✓	✓	✓	30%	
<p><b><u>AT3. Paper Development (40%):</u></b> Each student is required to develop a research article or discussion paper using the specific framework or methodology.</p>	✓	✓	✓	✓	40%	
					100%	

## 5. Assessment Rubrics

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

<b>Assessment Task</b>	<b>Criterion</b>	<b>Excellent (A+, A, A-)</b>	<b>Good (B+, B)</b>	<b>Marginal (B-, C+, C)</b>	<b>Failure (F)</b>
AT1 to AT3	Demonstrate the ability to acquire knowledge about a specific IS research framework or methodology	High	Significant	Moderate	Not even reaching marginal levels
	Demonstrate the capability to develop an understanding of the direction and theories of the IS research framework or methodology	High	Significant	Moderate	Not even reaching marginal levels
	Demonstrate the ability to apply the IS research framework or methodology to solve IS research problem	High	Significant	Moderate	Not even reaching marginal levels
	Demonstrate the capability to demonstrate the ability to develop comprehensive research article or discussion paper following the research methodology	High	Significant	Moderate	Not even reaching marginal levels

Applicable to students admitted before Semester A 2022/23

<b>Assessment Task</b>	<b>Criterion</b>	<b>Excellent (A+, A, A-)</b>	<b>Good (B+, B, B-)</b>	<b>Fair (C+, C, C-)</b>	<b>Marginal (D)</b>	<b>Failure (F)</b>
AT1 to AT3	Demonstrate the ability to acquire knowledge about a specific IS research framework or methodology	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Demonstrate the capability to develop an understanding of the direction and theories of the IS research framework or methodology	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Demonstrate the ability to apply the IS research framework or methodology to solve IS research problem	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Demonstrate the capability to demonstrate the ability to develop comprehensive research article or discussion paper following the research methodology	High	Significant	Moderate	Basic	Not even reaching marginal levels

## Part III Other Information

### 1. Keyword Syllabus

1. Introduction to IS Research: evolution and status of IS; nature and characteristics of IS research; research frameworks for IS; areas of current IS research; characteristics of good research.
2. The IS Research Process: identifying a research problem; theory building; measurement; research design; survey research; experimental research; case study research; qualitative research; data analysis; system development; ethical issues; developing research proposals; publishing research results.

### 2. Reading List

#### 2.1 Compulsory Readings

1.	Nil
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#### 2.2 Additional Readings

##### General Reading:

Zhang, S., Huang, L. and Yu, Dong-Hui, "An Analysis of Information Systems Research in Chinese Mainland," CAIS, 17, 2006, pp. 785-800.

Nissen, M. and Sengupta, K., "Incorporating Software Agents into Supply Chains: Experimental Investigation with a Procurement Task," MIS Quarterly, 30(1), 2006, pp. 145-166.

Gregor, S., "The Nature of Theory in Information Systems," MIS Quarterly, 30(3), 2006, pp. 611-642.

Hevner, A., March, S., Park, J. and Ram, S., "Design Science in Information Systems Research," MIS Quarterly, 28(1), 2004, pp. 75-105.

Benbasat, I. and Zmud, B., "The Identity Crisis Within the IS Discipline: Defining and Communicating the Discipline's Core Properties," MIS Quarterly, 27(2), 2003, pp. 183-194.

Wand, Y. and Weber, R., "Information Systems and Conceptual Modeling - A Research Agenda," Information Systems Research, Vol. 13, No. 4, 2002, pp. 363-376.

Iivari, J., Hirschhem, R. and Heinz, K., "A Dynamic Framework for Classifying Information Systems Development Methodologies and Approaches," Journal of Management Information Systems, (17:3) 2001, pp. 179-218.

Alavi, M.A. and Leidner, D.E., "Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues," MIS Quarterly, 25(1), 2001, pp. 107-136.

Ein-Dor, P. and Segev, E., "A Classification of Information Systems: Analysis and Interpretation,"

Information Systems Research, 12(1), 1995, pp. 171-197.

Simon, H.A., "Artificial-Intelligence - An Empirical Science," Artificial Intelligence, 77 (1): 95-127 Aug 1995.

Kankanhalli, A., Tan, B. and Wei, K., "Contributing Knowledge to Electronic Knowledge Repositories: An Empirical Investigation," MIS Quarterly, 29(1), 2005, 113-143.

### **Readings of the Behavioural Stream:**

Pavlou, P. and El Sawy, O., "From IT Leveraging Competence to Competitive Advantage in Turbulent Environments: The Case of New Product Development," **Information Systems Research**, 17(3), 2006, pp. 198-227.

Bock, G., Zmud, R., Kim, Y. and Lee, J., "Behavioral Intention Formation in Knowledge Sharing: Examining the Roles of Extrinsic Motivators, Social-Psychological Forces and Organizational Climate," MIS Quarterly, 29(1), 2005, pp. 87-111.

Wade, M. and Hulland, J., "Review: The Resource-Based View and Information Systems Research: Review, Extension, and Suggestions for Future Research," MIS Quarterly, 28(1), 2004, pp. 107-142.

Devaraj, S. and Kohli, R., "Performance Impacts of Information Technology: Is Actual Usage the Missing Link?," Management Science (49:3), 2003, pp.273-289.

Sambamurthy, V., Bharadwaj, A. and Grover, V., "Shaping Agility through Digital Options: Reconceptualizing the Role of Information Technology in Contemporary Firms," MIS Quarterly (27:2), 2003, pp. 237-263.

Lyytinen, K. and Rose, G.M., "The Disruptive Nature of Information Technology Innovations: The Case of Internet Computing in Systems Development Organizations," MIS Quarterly, 27(4), 2003, pp. 557-595.

Bharadwaj, A.S., "A Resource-Based Perspective on Information Technology Capability and Firm Performance: An Empirical Investigation," MIS Quarterly, 2000, (24:1), pp. 169-196.

Klein, H. and Myers, M., "A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems," MIS Quarterly, 1999, 23(1).

Benbasat, I. and Zmud, R., "Empirical Research in Information Systems: The Practice of Relevance," MIS Quarterly, 1999, 23(1), pp. 3-15.

Lewis, Marianne W. and Andrew J. Grimes, "Metatriangulation: Building Theory From Multiple

Paradigms,” Academy of Management Review, 1999, 24(4), pp. 672-690.

Lee, A., “Rigor and Relevance in MIS Research: Beyond the Approach of Positivism Alone,” MIS Quarterly, 1999, 23(1), pp. 29-33.

Xin, K. and Pearce, J., “Guanxi: connections as substitutes for Formal institutional support,” Academy of Management Journal, 1996, 36(6), pp. 1641-1659.

Walsham, G., “The Emergence of Interpretivism in IS Research,” Information Systems Research, vol. 6, No. 4 (December 1995), pp. 376-394.

Whetten, David A., “What Constitutes A Theoretical Contribution?” Academy of Management Review,” 1989, 14 (4), pp. 490-495.

Weick, Karl E., “Theory Construction As Disciplined Imagination,” Academy of Management Review, 1989, 14(4), pp. 516-531.

### **Readings of the Technical Stream:**

Jurisica, I., Mylopoulos, J. and Yu, E., “Ontologies for knowledge management: An information systems perspective,” Knowledge and Information Systems, 2004, 6(4), pp. 380-401.

Weber, R., “Conceptual Modelling and Ontology: Possibilities and Pitfalls,” Journal of Database Management, 2003, 14(3), pp. 1-20.

Panu Korpiää, et. al., “Managing Context Information in Mobile Devices,” IEEE Transactions on Pervasive Computing, 2003, 2(1).

Valeria Cardellini, Emiliano Casalicchio, Michele Colajanni and Philip S. Yu, “The state of the art in locally distributed Web-server systems,” ACM Computing Surveys, 2002, 34(2), pp. 263 – 311.

Gal, A. and Mylopoulos, J., “Toward Web-based application management systems,” IEEE transactions on knowledge and data engineering, 13 (4): 683-702 JUL-AUG 2001.

Mylopoulos J., Chung, L. and Yu, E., “From object-oriented to goal-oriented requirements analysis,” Communications of the ACM, vol. 42, No. 1, Jan 1999, pp. 31-37.

Chen, M.S., Han, J.W. and Yu, P.S., “Data mining: An overview from a database perspective,” IEEE Transactions On Knowledge And Data Engineering, 8 (6): Dec. 1996; pp 866-883.

Wooldridge, M. and Jennings, N., “Intelligent agents: theory and practice,” The Knowledge Engineering



Review, 1995, vol. 10, No. 2, pp. 115-152. 1995.

Wand Y., Monarchi D.E., Parsons J. and Woo C.C., “Theoretical foundations for conceptual modelling in information systems development,” Decision Support Systems, 15, 1995, pp. 285-304.

Agrawal, R., Imielinski, T. and Swami, A., “Database mining: a performance perspective,” IEEE Transactions on Knowledge and Data Engineering, vol. 5, Issue 6, Dec. 1993 pp. 914 – 925.

Teorey, T., Dongqing Yang, D. and Fry, J., “A logical design methodology for relational databases using the extended entity-relationship model,” ACM Computing Surveys (CSUR), vol. 18, Issue 2 (June 1986), pp. 197 – 222.

### **Readings of Quantitative Modelling:**

#### **Discrete Optimization Problems**

- “A Comparison of Pair versus Solo Programming under Different Objectives: An Analytical Approach,” (with Milind Dawande, Monica Johar, and Subodha Kumar), *Information Systems Research*, Vol. 19, No. 1, March 2008, pp. 71-92.
- “Maximum Commonality Problems: Applications and Analysis,” (with Milind Dawande, Subodha Kumar, and Chelliah Sriskandarajah), *Management Science*, Vol. 54, No. 1, January 2008, pp. 194-207.
- “Redesigning Expert systems: Heuristics for Efficiently Generating Low Cost Information Acquisition Strategies,” Vol. 11, No. 3, *INFORMS Journal on Computing*, Summer 1999. (with Michael Mannino).

#### **Applications of Control Theory**

- “Optimal Software Development: A Control Theoretic Approach,” *Information Systems Research* Vol. 16, 2005. (with Yonghua Ji and Suresh Sethi).
- “Maintaining Diagnostic Knowledge-based Systems: A Control Theoretic Approach,” Forthcoming at *Management Science*. (with Alain Bensoussan, Radha Mookerjee, and Wei Yue).
- “When Hackers Talk: Managing Information Security Under Variable Attack Rates and Information Dissemination,” (with Wei Yue, Radha Mookerjee, and Alain Bessoussain). Under Second Review, *Information Systems Research*.

#### **Probabilistic Systems and Policy Analysis**

- “Optimal Order Processing Policies for Electronic Commerce Servers,” *Inform Journal on Computing*, Vol. 17, No. 1, 2005, (with Yong Tan and Kamran Moinzadeh).
- “Policies for Data Archival in Hierarchical Storage Management,” *European Journal on Operations Research*, Vol. 138, No. 2, pp. 413-435, 2002.
- “Analysis of a Least Recently Used Cache Management Policy for Web Browsers,” *Operations Research*, Vol. 50, pp. 345-357, 2002. (with Yong Tan).

### **Applications of Game theory and Differential Game Theory**

- “Analyzing Incentives for Sharing in P2P Networks when Distributing Delay-sensitive Content,” Forthcoming at *Information Systems Research* (with Monica Johar and Syam Menon)
- “A Model of Content Provision in the Presence of Peer-to-Peer Networks,” (with Monica Johar and Nanda Kumar). 2012, *Information Systems Research*.
- “Advertising Strategies in Electronic Retailing: A Differential Games Approach,” (with Dengpan Liu and Subodha Kumar). 2012, *Information Systems Research*.