

**City University of Hong Kong
Course Syllabus**

**offered by Department of Information Systems
with effect from Semester B 2020/21**

Part I Course Overview

Course Title: Business Data Analytics

Course Code: IS6402P

Course Duration: Intensive mode: 3 days

Credit Units: 1.5

Level: P6

Medium of Instruction: Putonghua supplemented by English

Medium of Assessment: Chinese

Prerequisites:
(Course Code and Title) Basic knowledge of statistics

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

The course mainly focuses on the introduction to theories, implementation, and tools of intelligence algorithms, the analysis of business cases, performance evaluation of different models.

The course aims to enable students to understand how to achieve business intelligence from theory to practice. The course cultivates students to master practical abilities, such as collecting data, preprocessing and analyzing data via SAS and Python, solving data analysis questions, in order to assist companies' decision making and management, and improve its effectiveness. On completion of the course, students should be able to:

- (a) understand the basic concepts of business data analytics and intelligence;
- (b) master the theoretical knowledge of general intelligent models and their evaluation, implementation process, and tools;
- (c) understand how to choose an appropriate model to analyze specific business cases;
- (d) know the required abilities that are necessary for business intelligence talents.

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.	Understand the basic concepts of data analytics and business intelligence.	25%	✓		
2.	Master the theories of general intelligent models, including supervised learning (e.g., regression analysis and decision tree) and unsupervised learning (e.g., clustering and association analysis), and their evaluation methods.	35%	✓	✓	
3.	Understand the specific implementation process and corresponding tools of intelligent models.	20%	✓	✓	
4.	Accomplish the operation and analysis of a specific business case, and effectively demonstrate the analytical results in oral, written, and electronic formats.	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)

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

TLA	Brief Description	CILO No.				Hours/ week (if applicable)
		1	2	3	4	
TLA1. Lecture	Explain the concepts of business intelligence, the theories, evaluation, operation process, and corresponding tools of intelligent models. Express accurately business questions and data mining tasks, and apply intelligent models to solve specific business cases.	✓	✓	✓		
TLA2. Case Presentation	Present the implementation steps, analysis process, and application of tools (e.g., SAS and Python).	✓	✓	✓	✓	
TLA3. Group Project	Students would have to complete a group project to investigate a real business case, including the choice of business question, data collection, achievement and evaluation of intelligent models, and analysis of results.	✓	✓	✓	✓	

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Indicative of likely activities and tasks students will undertake to learn in this course. Final details will be provided to students in their first week of attendance in this course.

Assessment Tasks/Activities	CILO No.				Weighting	Remarks
	1	2	3	4		
Continuous Assessment: 100%						
<u>AT1. Class Performance</u> Involvement degree in class discussions. The main forms include: (1) apply the concepts learned from the class in the class discussions; (2) apply the knowledge learned from extracurricular reading activities in the class discussions; (3) propose questions that can be discussed in class; (4) share personal experiences related to the discussed topics.	✓	✓	✓	✓	60%	
<u>AT2. Group Project</u> A group project, which includes a written report or an oral presentation (if necessary), will be assigned to students to investigate a practical business case chosen from given cases in class, or other cases that interest the students. The project includes the exploration of business question and data mining tasks of a business case, the implementation of intelligent model(s), and the analysis of model results through applying the learned knowledge. Each group will contain 3 to 4 students.	✓	✓	✓	✓	40%	
Examination: 0% (duration: N/A)						
					100%	

Students must pass BOTH Class Performance and Group Project in order to get an overall pass in this course.

5. Assessment Rubrics

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

No.	Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1.	AT1. Class Performance	Ability to show enthusiasm in discussing class questions and raising critical opinions.	High	Significant	Moderate	Basic	Not even reaching marginal levels
		Ability to raise sensible questions and give an insightful discussion of issues relating to the course topics in class, and to promote the interactions between teacher and students in class.	High	Significant	Moderate	Basic	Not even reaching marginal levels
2.	AT2. Group Project	Ability to explore data mining tasks for a specific business problem.	High	Significant	Moderate	Basic	Not even reaching marginal levels
		Ability to choose the appropriate intelligent model(s) for a business problem and accomplish the model(s).	High	Significant	Moderate	Basic	Not even reaching marginal levels
		Ability to critically analyze and reasonably explain the results.	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.)

- Introduction and Overview
 - Data, information, knowledge, and decision
 - Business intelligence
 - Data mining task
 - Data collection and preprocessing
 - Data mining tools (Python & SAS)
- Decision Trees
 - Information entropy, information gain
 - Pruning criteria
 - Complete tree
- Regression Analysis
 - Linear regression, logistic regression
 - Least-squares estimation
 - Maximum likelihood estimation
 - Statistical hypothesis testing
- Model Evaluation
 - Accuracy, misclassification
 - ROC
 - Cumulative gains
 - Lift chart
- Unsupervised Learning
 - Clustering
 - Similarity
 - K-means clustering
 - Hierarchical clustering
 - Association analysis

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. Three are also collections of e-books, e-journals available from the CityU Library.)

Nil

2.2 Additional Readings

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

1. Ahlemeyer-Stubbe, A., & Coleman, S. (2014). A practical guide to data mining for business and industry. John Wiley & Sons.
2. Chen, H., Chiang, R. H., & Storey, V. C. (2012). Business intelligence and analytics: From big data to big impact. *MIS quarterly*, 1165-1188.
3. Moss, L. T., & Atre, S. (2003). Business intelligence roadmap: the complete project lifecycle for decision-support applications. Addison-Wesley Professional.
4. Sherman, R. (2014). Business intelligence guidebook: From data integration to analytics. Newnes.
5. Howson, C. (2007). Successful business intelligence. Tata McGraw-Hill Education.
6. Efraim, T., Sharda, R., & Delen, D. (2014). Business intelligence and analytics: Systems for decision support.
7. Biere, M. (2003). Business intelligence for the enterprise. Prentice Hall Professional.
8. 吴军 (2016) 中信出版集团 “智能时代” ISBN: 9787508663814
9. Ian Witten (2011) 机械工业出版社 “数据挖掘” ISBN 9787111182054