

**City University of Hong Kong  
Course Syllabus**

**offered by College of Business  
with effect from Semester A 2022/23**

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**Part I Course Overview**

<b>Course Title:</b>	Data Analytics with Business Applications
<b>Course Code:</b>	FB6711
<b>Course Duration:</b>	One Semester
<b>Credit Units:</b>	3
<b>Level:</b>	P6
<b>Medium of Instruction:</b>	English
<b>Medium of Assessment:</b>	English
<b>Prerequisites:</b> <i>(Course Code and Title)</i>	Basic knowledge on statistics
<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

The course aims to teach students data mining and predictive analytics models and tools for data analysis in business related applications, including applications in finance, marketing and operations etc. The course will also teach students practical skills on handling data, conducting analysis in statistical software packages, and visualizing and presenting data analysis findings.

On completion of the course students should be able to

- (a) formulate relevant business problems into the framework of data analytics;
- (b) develop appropriate analytics models based on applications and available data;
- (c) implement the models and conduct analysis in a software package, such as R; and
- (d) analyse and interpret the outputs of models to support decision making in finance, marketing, operations, etc.

### 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.	Formulate relevant business problems into the framework of data analytics.	30%	✓		
2.	Develop appropriate data analytics models based on applications and available data.	30%	✓	✓	
3.	Implement data analytics models and conduct analysis in a data analysis software package.	20%		✓	✓
4.	Analyze and interpret the outputs of data analytics models to support decision making in finance, marketing, operations, etc.	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			
1. Lecture	Seminars are designed to explain the concepts of a selection of popular data analytics techniques, and to discuss data analytics cases and applications in finance, marketing, operations, etc., with a focus on problem formulation, model development and results presentation.	2	2	1	1			27 hours
2. Laboratory	Demonstrations by instructor and hands-on exercises by students on implementing data analytics models and solving the selected analytics problems using a data-analysis software package.	1	2	2	1			9 hours
3. Group project	Students would have to participate a group project to investigate a real life case in finance, marketing, or other area. The project will apply business data analytics techniques to address the problem. Students will contribute to the project and inspect the process of the project conduction.	2	2	2	2			3 hours

(1: Indirectly Supporting ILO; 2: Directly Supporting ILO)

### 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%								
Participation / Interaction	2			1			15%	
Assignments	2	2	2	1			15%	
Group projects	2	2	2	2			20%	
In-class Quiz:							30%	
Individual Case Study:							20%	
							100%	

(1: ILO moderately assessed by AT; 2: ILO heavily assessed by AT)

## 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. Participation / Interaction	Active learning efforts shown through class discussion, questions, etc.	High evidence of active participation in class discussion, questions, etc.	Significant evidence of active participation in class discussion, questions, etc.	Moderate evidence of active participation in class discussion, questions, etc.	Little evidence of active participation in class discussion, questions, etc.
2. Assignments	Performance in the submitted homework assignments	Strong evidence of understanding the key concepts and definitions of the learned subject	Evidence of understanding the key concepts and definitions of the learned subject	Certain evidence of understanding the key concepts and definitions of the learned subject	Little evidence of familiarity with the subject matter
3. Group projects	Performance in collaboration and contribution to the data analysis project	Students perform excellently in contributing knowledge to the project and deal with issues in collaboration	Students perform well in contributing knowledge to the project and deal with issues in collaboration	Students perform reasonably well in contributing knowledge to the project and deal with issues in collaboration	Students perform badly in contributing knowledge to the project and deal with issues in collaboration
4. In-class Quiz	Performance in answering questions	Students perform excellently in the test and provide very good answers to test questions.	Students perform well in the test and provide good answers to test questions.	Students perform reasonably well in the test and provide some good answers to test questions.	Students perform badly in the test and cannot provide acceptable answers to test questions.
5. Individual Case Study	Performance in the submitted case study that analyse the use of data analytics in business applications	Strong evidence of capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base	Some evidence of critical capacity and analytic ability; reasonable understanding of issues in practice	Evidence on understanding of the subject; Some understanding of issues in practice	Little evidence of familiarity with the subject matter; no understanding of issues in practice

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. Participation / Interaction	Active learning efforts shown through class discussion, questions, etc.	High evidence of active participation in class discussion, questions, etc.	Significant evidence of active participation in class discussion, questions, etc.	Moderate evidence of active participation in class discussion, questions, etc.	Basic evidence of active participation in class discussion, questions, etc.	Little evidence of active participation in class discussion, questions, etc.
2. Assignments	Performance in the submitted homework assignments	Strong evidence of understanding the key concepts and definitions of the learned subject	Evidence of understanding the key concepts and definitions of the learned subject	Certain evidence of understanding the key concepts and definitions of the learned subject	Certain familiarity with the subject matter to enable the student to progress further	Little evidence of familiarity with the subject matter
3. Group projects	Performance in collaboration and contribution to the data analysis project	Students perform excellently in contributing knowledge to the project and deal with issues in collaboration	Students perform well in contributing knowledge to the project and deal with issues in collaboration	Students perform reasonably well in contributing knowledge to the project and deal with issues in collaboration	Students fairly perform in contributing knowledge to the project and deal with issues in collaboration	Students perform badly in contributing knowledge to the project and deal with issues in collaboration
4. In-class Quiz	Performance in answering questions	Students perform excellently in the test and provide very good answers to test questions.	Students perform well in the test and provide good answers to test questions.	Students perform reasonably well in the test and provide some good answers to test questions.	Students fairly perform in the test and provide some acceptable answers to test questions.	Students perform badly in the test and cannot provide acceptable answers to test questions.
5. Individual Case Study	Performance in the submitted case study that analyse the use of data analytics in business applications	Strong evidence of capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base	Some evidence of critical capacity and analytic ability; reasonable understanding of issues in practice	Evidence on understanding of the subject; Some understanding of issues in practice	Some evidence on understanding of subject; limited understanding of issues in practice	Little evidence of familiarity with the subject matter; no understanding of issues in practice

**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.)*

- Regressions: linear and nonlinear regressions, nearest neighbours
- Classifications: logistic regression and linear discriminant analysis
- Model validation and regularization
- Tree-based models
- Text mining and social network analysis
- Applications: credit scoring, online recommendation, advertisement, healthcare etc.

**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.	Nil
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**2.2 Additional Readings**

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

1.	Alberto Boschetti, Luca Massaron, Python Data Science Essentials, 2e, Packet Publishing, 2016, 978-1786462138
2.	G. James, D. Witten, T. Hastie, R. Tibshirani. An introduction to statistical learning with applications in R. Springer 2013.
3.	John W. Foreman, Data Smart: Using Data Science to Transform Information into insight, 978-1118661468