

**City University of Hong Kong
Course Syllabus**

**offered by Department of Information Systems
with effect from Semester A 2018 / 2019**

Part I Course Overview

Course Title: Business Intelligence and Analytics

Course Code: IS4834

Course Duration: One Semester (13 weeks)

Credit Units: 3

Level: B4

Arts and Humanities

Proposed Area:
(for GE courses only)

Study of Societies, Social and Business Organisations

Science and Technology

Medium of Instruction: English

Medium of Assessment: English

Prerequisites:
(Course Code and Title) Nil

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)

We are in the era of big data. Large volume of data could reveal useful information about customers, products or other strategic aspects. This course aims to equip students with knowledge and skills to extract information and knowledge from vast amount of data and discover actionable insights. It emphasizes on the current issues, methodologies, practice, and emerging trends in business intelligence and analytics. Students will learn state-of-art techniques and critical skills to address existing business problems in today's information-rich environments. Upon completing this course, students will build their analytical capabilities to use data for innovative business solutions.

Topics will cover, but are not limited to, the following:

- 1) Descriptive, predictive and prescriptive analytics (e.g. data mining techniques, prediction modelling, business intelligence and machine learning);
- 2) Business applications (e.g., social network analysis, market-basket analysis, fraud detection, credit scoring, and loan application).

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. | Recognize the need for business intelligence to support business management. | 10% | ✓ | ✓ | ✓ |
| 2. | Apply the concepts and techniques of business intelligence and analytics in business practice. | 30% | ✓ | ✓ | ✓ |
| 3. | Apply information technologies for data analytics. | 30% | ✓ | ✓ | ✓ |
| 4. | Analyze the requirements for management support and identify appropriate tools and techniques for data analytics in order to create innovative business intelligence solutions. | 30% | | ✓ | ✓ |
| | | 100% | | | |

* If weighting is assigned to CILOs, they should add up to 100%.

[#] Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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 | Concepts and applications of information technology in the context of business intelligence and analytics are explained by instructor. | ✓ | ✓ | ✓ | ✓ | Lecture: 2 Hours/Week |
| TLA2: Laboratory/ Tutorial | During laboratory/tutorial sessions, the following activities are used to reinforce the learning and practice of various business intelligence and data analytics techniques learnt in lectures: <ul style="list-style-type: none"> • <i>Exercises</i>: Hands-on activities using database management systems, SQL and business intelligence software to perform data analytics techniques of classification, clustering, and association rule mining. • <i>Discussion</i>: Discussion of various concepts learnt in lectures, and exemplified with exercise to demonstrate the applicability of various techniques in business intelligence and data analytics. • <i>Presentations</i>: Members of project team will make presentation of their project work, and the rest of the tutorial group and the instructor will comment and offer suggestions for improvements. | | ✓ | ✓ | ✓ | Laboratory: 1 Hour/Week |
| TLA3: Project | Students will have to complete a group project requiring them to adopt business intelligence and data analytics technology to solve business problems. | | ✓ | ✓ | ✓ | |

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: 50% | | | | | | |
| <u>AT1: Lecture, Laboratory Exercises and Participation</u> Each seminar and laboratory may consist of exercises, quizzes, small group discussions, self reflection, or student presentations to assess students' abilities to apply their skills. | ✓ | ✓ | ✓ | ✓ | 20% | |
| <u>AT2: Group Project</u> A group project, which includes a project report and presentation, will be allocated to let students apply business intelligence and data analytics concepts and technologies to solve business problems. | ✓ | ✓ | ✓ | ✓ | 30% | |
| Examination: 50% (duration: one 2-hour exam) | | | | | | |
| <u>AT3: Examination</u> A written examination to assess students' competence of the taught subjects | ✓ | ✓ | ✓ | ✓ | 50% | |
| * The weightings should add up to 100%. | | | | | 100% | |

Remark: Students must pass BOTH coursework and examination 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.)

| Assessment Task (AT) | Criterion | Excellent (A+, A, A-) | Good (B+, B, B-) | Fair (C+, C, C-) | Marginal (D) | Failure (F) |
|--|--|-----------------------|------------------|------------------|--------------|-----------------------------------|
| AT1: Lecture, Laboratory Exercises and Participation | Ability to accurately describe all key concepts of business intelligence and data analytics; and deep understanding of their importance to business. | High | Significant | Moderate | Basic | Not even reaching marginal levels |
| | Ability to evaluate accurately the requirements of business intelligence and data analytics in order to transform massive amounts of transaction data into data warehouse of appropriate architecture. | High | Significant | Moderate | Basic | Not even reaching marginal levels |
| | Capability to compare and evaluate accurately and profoundly about distinguished impact of technologies for business intelligence and data analytics. | High | Significant | Moderate | Basic | Not even reaching marginal levels |
| | Capability to reasonably and effectively formulate and discriminate the requirements of management support; show well-rounded knowledge in identifying most appropriate existing data analytics tools and technique for respective system implementation problems. | High | Significant | Moderate | Basic | Not even reaching marginal levels |
| AT2: Group Project | Ability to accurately describe all key concepts of business intelligence and data analytics; and deep understanding of their importance to business. | High | Significant | Moderate | Basic | Not even reaching marginal levels |
| | Ability to evaluate accurately the requirements of business intelligence and data analytics in order to transform massive amounts of transaction data into data warehouse of appropriate architecture. | High | Significant | Moderate | Basic | Not even reaching marginal levels |
| | Capability to compare and evaluate accurately and profoundly about distinguished impact of technologies for business intelligence and data analytics. | High | Significant | Moderate | Basic | Not even reaching marginal levels |
| | Capability to reasonably and effectively formulate and discriminate the requirements of management support; show well-rounded knowledge in identifying most appropriate existing data analytics tools and technique for respective system implementation problems. | High | Significant | Moderate | Basic | Not even reaching marginal levels |

| | | | | | | |
|---------------------|--|------|-------------|----------|-------|-----------------------------------|
| AT3: Examination | Ability to accurately describe all key concepts of business intelligence and data analytics; and deep understanding of their importance to business. | High | Significant | Moderate | Basic | Not even reaching marginal levels |
| | Ability to evaluate accurately the requirements of business intelligence and data analytics in order to transform massive amounts of transaction data into data warehouse of appropriate architecture. | High | Significant | Moderate | Basic | Not even reaching marginal levels |
| | Capability to compare and evaluate accurately and profoundly about distinguished impact of technologies for business intelligence and data analytics. | High | Significant | Moderate | Basic | Not even reaching marginal levels |
| | Capability to reasonably and effectively formulate and discriminate the requirements of management support; show well-rounded knowledge in identifying most appropriate existing data analytics tools and technique for respective system implementation problems. | High | Significant | Moderate | Basic | Not even reaching marginal levels |

Part III Other Information

1. Keyword Syllabus

(An indication of the key topics of the course.)

Data mining process model (e.g. CRISP-DM); Data preprocessing and graphics; Linear and logistic regression; Decision tree; Cluster analysis; Association rules; Time series analysis; Social network analysis; Performance evaluation of prediction models

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.)

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|----|--|
| 1. | R. Sharda, D. Delen and E. Turban, <i>Business Intelligence, Analytics, and Data Science: A Managerial Perspective</i> , Pearson, 2018. |
| 2. | Michael J.A. Berry and Gordon S. Linoff, <i>Data Mining Techniques: For Marketing, Sales, and Customer Relationship Management</i> . John Willey & Sons, 2011. |

2.2 Additional Readings

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

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|----|--|
| 1. | James R. Evans, <i>Business Analytics</i> . Pearson, 2017. |
| 2. | Ramesh Sharda, Dursun Delen, and Efraim Turban, <i>Business Intelligence and Analytics: Systems for Decision Support</i> . Prentice Hall, 2014. |
| 3. | Foster Provost and Tom Fawcett, <i>Data Science for Business: What You Need to Know about Data Mining and Data-analytic Thinking</i> . O'Reilly Media, Inc., 2013. |
| 4. | Jiawei Han, Micheline Kamber, and Jian Pei, <i>Data Mining Concepts and Techniques</i> . Morgan Kauffman, 2011. |
| 5. | Galit Shmueli, Nitin R. Patel, and Peter C. Bruce, <i>Data Mining for Business Intelligence</i> : |

| | |
|----|--|
| | <i>Concepts, Techniques, and Applications in Microsoft Office Excel with XLMiner</i> . John Willey & Sons, 2010. |
| 6. | Thomas H. Davenport, Jeanne G. Harris, and Robert Morison, <i>Analytics at Work: Smarter Decisions, Better Results</i> . Harvard Business Press, 2010. |
| 7. | Thomas H. Davenport and Jeanne G. Harris, <i>Competing on Analytics: The New Science of Winning</i> . Harvard Business Press, 2007. |

2.3 Online Resources

Additional reading material will be provided by the lecturer.

