City University of Hong Kong

Information on a Course
offered by Department of Information Systems
with effect from Semester B in 2014 / 2015

Part I

Course Title: Big Data Management
Course Code: CB2021
Course Duration: One Semester (13 weeks)
No. of Credit Units: 3
Level: B2-4
Medium of Instruction: 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

1. Course Aims:

Big data is one of the most important disruptive information technologies that transforms the business and society today. Local and global business firms start to realize the importance of big data, they invest heavily in these areas to drive substantial enhancements in their business models, partnerships and business processes. This trend creates great demand for our graduates and business professionals with knowledge and skills in big data management for business innovations.

This course aims to:
- Provide students with a solid understanding of the principles, methods and technologies for big data management to drive business innovations;
- Equip students with the essential knowledge and skills to design a plan for big data management and evaluate the effectiveness of the proposed solution;
- Enable students to apply the learnt methods and technologies in big data management for business improvements and innovations.
2. Course Intended Learning Outcomes (CILOs)

Upon successful completion of this course, students should be able to:

<table>
<thead>
<tr>
<th>No.</th>
<th>CILOs</th>
<th>Weighting (if applicable)</th>
<th>DEC Dimensions (Ability/Attitude/Accomplishment)</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Understand the principles, methods and technologies of big data management for business improvements and innovations.</td>
<td>3</td>
<td>Attitude and ability</td>
</tr>
<tr>
<td>2.</td>
<td>Design strategic plans for using big data management to solve business problems, and evaluate the effectiveness of the proposed solutions.</td>
<td>3</td>
<td>Ability and accomplishment</td>
</tr>
<tr>
<td>3.</td>
<td>Develop solutions using methods and technologies in big data for business improvements and innovations.</td>
<td>3</td>
<td>Ability and accomplishment</td>
</tr>
</tbody>
</table>

(Remarks: 3: Relatively most focused ILOs; 2: moderately focused ILOs; 1: less focused ILOs)

3. Teaching and learning Activities (TLAs)
(designed to facilitate students’ achievement of the CILOs)

Lecture: 26 hours  
Laboratory: 13 hours

**TLA1: Lecture**

Concepts, knowledge and skills of big data analytics and cloud services are explained in the lectures.

- *In-class discussion*: Students participate in discussions in lectures (e.g. face-to-face discussion, using course management platforms) and the lecturer provides feedback based on students’ responses.
- *Recap*: In the beginning of every lecture, the lecturer will summarize the topics covered in the previous lecture and provide feedback based on students’ concerns and questions.

**TLA2: Tutorials and case studies**

The tutorial covers the concepts, methods and theories of various aspects of big data management.

- *Tutorial exercises*: e.g. hands-on activities on big data management related to big data privacy, big data quality and business process integrations, etc.
- *Case studies*: Students will be given a case or project in areas of location-based services or profile-based recommendation services using big data. There will be many discussions on various aspects of the case or project for improving the brands or achieving the business success.

**TLA3: Outside classroom activities**

Additional help provided outside official class time.

- *Online Helpdesk*: An online course management system is available to provide extra help to students having difficulties with the course outside the classroom. Students can raise questions about the concepts, methods and cases and tutors will answer students’ questions online.
4. Assessment Tasks/Activities

**AT1: Participation (10%)**
10% of the marks will be given to student’s attendance and participation, as measured by the quality of questions, answers and student engagement in both lectures and tutorials throughout the semester.

**AT2: Group Project (30%)**
There will be a group project associated with the course. The grading of the project will be based on academic quality together with the measurable usage data and peer ranking in the class. The topic of the project should be related to application of big data management for business improvements and innovations. The project members will utilize discovery-driven strategies, and develop a new business proposal. The project requires a project proposal and a presentation.

**AT3: Final Exam (60%, one 2-hour exam)**
The final exam will be closed book.

** Students must pass BOTH project and final examination in order to get an overall pass in this course. **

5. Grading of Student Achievement: Refer to Grading of Courses in the Academic Regulations.

The grading of student achievement is based on student performance in assessment tasks/activities. Standard grading pattern (A+, A, A- … C-, D, F) in the University will be followed.

Part III

Keyword Syllabus:
- Introduction
  - Concepts and principles of big data (e.g. volume, velocity, variety and veracity), market and business drivers, industry barriers and considerations for big data management in a business context.

- The business cases (1 week)
  - Characteristics of big data applications, perception and quantification of business values, assessing organizational fitness, and design of business cases for big data applications.
• Organizational alignment
  o Culture clash challenges, criteria for adopting big data technology, the role of organizational alignment.
  o Types of big data applications, product knowledge hub, infrastructure and operations studies, location-based services, profile-based recommendation services.

• Organizational strategy
  o The strategic plan for technology adoption, criteria to decide what, how and when big data technologies are right for you, good practices for soliciting business user requirements.

• Big data governance
  o Big data governance, the difference with big datasets, big data oversights, policy and processes for big data analytics.
  o Big data maturity models, big data privacy, and big data quality.

• High-performance appliance for big data management
  o Storage considerations, big data appliances (hardware and software tuned for big data applications), architectural choices, performance characteristics, platform alternatives.

• Big data tools and techniques
  o Overview of high-performance architectures, HDFS, MapReduce and YARN, Zookeeper, HBase, Hive and Mahout.

• Big data applications
  o Managing the lifecycle of big data, machine-to-machine data, big transaction data, biometrics, human-generated data.
  o Industry perspectives and case studies in governments, healthcare, utilities and communication service providers.

**Recommended Reading:**

**Textbook:**


**References:**
