

IS2021: BIG DATA MANAGEMENT

Effective Term

Semester B 2023/24

Part I Course Overview

Course Title

Big Data Management

Subject Code

IS - Information Systems

Course Number

2021

Academic Unit

Information Systems (IS)

College/School

College of Business (CB)

Course Duration

One Semester

Credit Units

3

Level

B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

CB2021 Big Data Management

Exclusive Courses

Nil

Part II Course Details

Abstract

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 model the requirements, 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.

Course Intended Learning Outcomes (CILOs)

CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1 Understand the principles, methods and technologies of big data management for business improvements and innovations.	30	x	x	
2 Design strategic plans for using big data management to solve business problems, and evaluate the effectiveness of the proposed solutions.	35		x	x
3 Develop solutions using conceptual modelling methods and technologies in big data for business improvements and innovations.	35		x	x

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 real-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.

Teaching and Learning Activities (TLAs)

3	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.	1, 2, 3	Seminar: 3 hours/week
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Assessment Tasks / Activities (ATs)

ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)	
1	AT1: Participation and tutorial exercises). 15% of the marks will be given to student' s participation and class exercises, as measured by the quality of answers as well as quizzes' marks got and student engagement in both lectures and tutorials throughout the semester.	1, 2, 3	15	
2	AT2: Group Project. 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.	1, 2, 3	35	

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Assessment Rubrics (AR)

Assessment Task

AT1: Participation and Tutorial Exercises

Criterion

Ability to demonstrate an understanding of the concepts, principles, methods and technologies of big data management for business improvements and innovations. High grade (measured by marks of the quizzes and written exercises) will be given to those who can demonstrate very clear concepts, principles, methods and technologies for big data management.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

AT1: Participation and Tutorial Exercises

Criterion

Ability to design strategic plans for using big data management to solve business problems, and evaluate the effectiveness of the proposed solutions. High marks will be given to those who can design strategic plans using big data management to solve the business problems effectively.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

AT1: Participation and Tutorial Exercises

Criterion

Capability to develop solutions using conceptual modelling methods and technologies in big data for business improvements and innovations. High marks will be given to those who can develop the solutions by means of conceptual modelling and relevant big data technologies for businesses effectively.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

AT2: Group Project

Criterion

Ability to demonstrate an understanding of the principles, methods and technologies of big data management for business improvements and innovations. High marks will be given to those who can demonstrate the use of big data concepts, principles and relevant technologies for business improvements and innovations effectively.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

AT2: Group Project

Criterion

Ability to design strategic plans for using big data management to solve business problems, and evaluate the effectiveness of the proposed solutions. High marks will be given to those who can design strategic plans using big data management tools to solve business problems effectively.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

AT2: Group Project

Criterion

Capability to develop solutions using conceptual modelling methods and technologies in big data for business improvements and innovations.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

AT3: Final Exam

Criterion

Ability to demonstrate an understanding of the principles, methods and technologies of big data management for business improvements and innovations.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

AT3: Final Exam

Criterion

Ability to design strategic plans for using big data management to solve business problems, and evaluate the effectiveness of the proposed solutions.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

AT3: Final Exam

Criterion

Capability to develop solutions using conceptual modelling methods and technologies in big data for business improvements and innovations.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Part III Other Information**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

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

Conceptual modelling to identify big data requirements and connect business goals and technologies

Culture clash challenges, criteria for adopting big data technology, the role of organizational alignment.

Types of big data applications, product knowledge hub, infrastructure and operations studies, location-based services, profile-based recommendation services.

Organizational strategy

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

Big data governance, the difference with big datasets, big data oversights, policy and processes for big data analytics.

Big data maturity models, big data privacy, and big data quality.

High-performance appliance for big data management

Storage considerations, big data appliances (hardware and software tuned for big data applications), architectural choices, performance characteristics, platform alternatives.

Big data tools and techniques

Overview of high-performance architectures, HDFS, MapReduce and YARN, Zookeeper, HBase, Hive and Mahout.

Big data applications

Managing the lifecycle of big data, machine-to-machine data, big transaction data, biometrics, human-generated data.

Industry perspectives and case studies in governments, healthcare, utilities and communication service providers.

Reading List**Compulsory Readings**

Title	
1	David Loshin, 2013, Big Data Analytics: From strategic planning to enterprise integration with tools, techniques, NoSQL and graph, Elsevier, ISBN: 978-0-12-417319-4.

Additional Readings

Title	
1	Sunil Soares, 2012, Big Data Governance: An emerging imperative, MC Press Online, ISBN: 978-1-58347-377-1.
2	Arvind Sathi, 2012, Big Data Analytics: Disruptive Technologies for Changing the Game, MC Press Online, ISBN: 978-1-58347-380-1.