IS2021: BIG DATA MANAGEMENT

Effective Term
Semester A 2024/25

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	Describe the principles, methods and technologies of big data management for business improvements and innovations.	30	x	x	
2	Formulate strategic plans for using big data management to solve business problems, and evaluate the effectiveness of the proposed solutions.	35		x	x
3	Formulate 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.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	LTA1: Lecture	Students will learn the concepts, knowledge and skills of big data analytics and cloud services 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.	1, 2, 3	Seminar:3 hours/week
2	LTA2: Tutorials and Case Studies	Students will learn in tutorials which cover the concepts, methods and theories of various aspects of big data management. Tutorial exercises: e.g. quizzes and 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.	1, 2, 3	Seminar:3 hours/week

3	LTA3: Outside classroom activities	Students will have 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

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, Elsvier, ISBM: 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.