

CB2203: DATA-DRIVEN BUSINESS MODELING

Effective Term

Semester A 2022/23

Part I Course Overview

Course Title

Data-driven Business Modeling

Subject Code

CB - College of Business (CB)

Course Number

2203

Academic Unit

Management Sciences (MS)

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

CB2200 Business Statistics; or
MA2172 Applied Statistics for Sciences and Engineering or equivalent

Equivalent Courses

Nil

Exclusive Courses

MS3261 Business Modeling with Spreadsheets
CB2011 Solving Business Problems with Spreadsheet Modeling

Part II Course Details

Abstract

This course aims to develop students' ability to formulate, analyse and solve business problems using data modeling. Real problems that companies encounter on a day-to-day basis are presented, with the aim of helping students derive applicable principles and link principles to practice. The goal of the course is to train students to become effective modellers who can derive data models for solving business problems in various functional areas.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	understand business problems, collect relevant data, and analyse the data	20	x		
2	formulate data models for the business problems using software	30		x	
3	select appropriate modeling techniques and implement the analysis for different business problems	30		x	
4	validate the results obtained from models, and communicate and explain the analysis and findings to non-specialists	20		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)

	TLAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures	In the lectures, students learn the concepts of modeling, formulation of business problems in various functional areas, and tools in modeling.	1, 3, 4	2
2	Laboratory Tutorials	Hands-on experience with the techniques and problem-solving activities based on real world business problems. The laboratory tutorials consolidate and supplement what the students learn in lectures.	1, 2, 3	1

3	Case Studies	Students solve particular business problems using modeling techniques and tools learned in the course.	1, 2, 3, 4	
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Assessment Tasks / Activities (ATs)

ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1 Assignments The assignments are designed to help students practise their problem-solving skills and obtain hands-on experience using spreadsheet modeling tools.	1, 2, 3, 4	20	
2 Quizzes The quizzes are designed to assess students' ability in problem formulation and business modeling.	1, 2, 3	30	

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Additional Information for ATs

The examination covers all topics of the course. It is designed to assess students' understanding on the concepts of business modeling, and their ability to apply them to solve business problems.

Assessment Rubrics (AR)**Assessment Task**

Assignments

Criterion

Assessing students' problem-solving skills and using spreadsheet modeling tools.

Excellent (A+, A, A-)

Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.

Good (B+, B, B-)

Evidence of grasp of subject, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with subject matter.

Fair (C+, C, C-)

Some evidence of understanding of the subject; ability to perform basic model building and data analysis.

Marginal (D)

Adequate familiarity with the subject matter; shows marginal ability to perform basic model building and data analysis.

Failure (F)

Little evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited or irrelevant use of literature.

Assessment Task

Quizzes

Criterion

Assessing students' ability in problem formulation and business modeling.

Excellent (A+, A, A-)

Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.

Good (B+, B, B-)

Evidence of grasp of subject, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with subject matter.

Fair (C+, C, C-)

Some evidence of understanding of the subject; ability to perform basic model building and data analysis.

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Adequate familiarity with the subject matter; shows marginal ability to perform basic model building and data analysis.

Failure (F)

Little evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited or irrelevant use of literature.

Assessment Task

Examination

Criterion

Assessing students' understanding on the concepts of business modeling, and their ability to apply them to solve business problems.

Excellent (A+, A, A-)

Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.

Good (B+, B, B-)

Evidence of grasp of subject, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with subject matter.

Fair (C+, C, C-)

Some evidence of understanding of the subject; ability to perform basic model building and data analysis.

Marginal (D)

Adequate familiarity with the subject matter to enable the student to progress without repeating the course.

Failure (F)

Little evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited or irrelevant use of literature.

Part III Other Information**Keyword Syllabus**

Business Modeling and Analysis

Data structure for different applications, Data analysis, Business modeling process, Problem formulation, Relationship analysis, Structural “what-if” analyses, Break-even analysis.

Multiple Regression Models

Concept of linear models, Data analysis using multiple regression models, Model significance. Statistical inferences about regression parameters.

Optimization with Excel Solver

Optimization, Use of Excel Solver, Sensitivity analysis, Applications include investment problem, inventory problem, optimal product mix, workforce and project scheduling, assignment problem, production planning, transportation problem.

Business Analysis through Simulation

Simulation, Monte Carlo method, Newsvendor problems, Queueing problems, Overbooking problems.

Reading List**Compulsory Readings**

Title	
1	B. Render, R.M. Stair Jr., and N. Balakrishnan, “Managerial Decision Modeling with Spreadsheets,” latest edition, Prentice Hall.

Additional Readings

Title	
1	Wayne L. Winston. Microsoft Excel: Data Analysis and Business Modeling. Microsoft Press, latest edition.
2	Stephen G. Powell and Kenneth R. Baker. Management Science: The Art of Modeling