

MS6221: PREDICTIVE MODELING IN MARKETING

Effective Term

Semester A 2026/27

Part I Course Overview

Course Title

Predictive Modeling in Marketing

Subject Code

MS - Decision Analytics and Operations

Course Number

6221

Academic Unit

Decision Analytics and Operations (DAOS)

College/School

College of Business (CB)

Course Duration

One Semester

Credit Units

3

Level

P5, P6 - Postgraduate Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

MS5218 Applied Linear Statistical Models

Precursors

Nil

Equivalent Courses

MS6218 Statistical Modelling in Marketing Engineering

Exclusive Courses

Nil

Part II Course Details

Abstract

The goal of this class is to provide a comprehensive overview of modern data-driven marketing techniques. We will explore key areas of marketing that rely on data-driven decisions, including targeted promotions and advertisements, churn management, recommender systems, pricing, and demand prediction. The course will emphasize applied predictive modeling in Python and the use of machine learning tools in the data science industry. Prerequisites include one course in probability and statistics, and one course in regression analysis. Students should expect to dedicate at least five hours of work following each lecture.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Enhance proficiency in Python programming for data analysis.	20	x	x	
2	Gain experience in analyzing real marketing data using statistical and machine learning models.	40		x	
3	Learn how to frame marketing decision problems (such as pricing, promotion, advertising, and customer relationship management) as data analysis tasks and make informed decisions based on statistical and machine learning model results.	40		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	Classroom Lectures	Students will engage in a structured schedule of regular lectures and demonstrations designed to enhance their understanding of the course material. Through active participation and interaction, students will have the opportunity to deepen their knowledge and grasp the intricacies of the content presented during these sessions.	1, 2, 3

2	Computer Lab Tutorials	Students will work on a variety of tasks, ranging from basic syntax exercises to more advanced coding challenges during these Python programming sessions.	1, 2	
3	Group Assignment	Students will team up and collaborate on coding projects to tackle coding challenges collectively and enhance their problem-solving skills.	1, 2, 3	

Assessment Tasks / Activities (ATs)

ATs		CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Assignment	1, 2, 3	30	Students can use AI tools to write their analysis program and suggest analysis results. Students are required to critically analyse these AI-generated pieces of work.	Yes
2	In-Class Midterm	2, 3	40	This is a closed book midterm test	No
3	Project	1, 2, 3	30	Students can use AI tools to write their analysis program and suggest analysis results. Students are required to critically analyse these AI-generated pieces of work.	Yes

Continuous Assessment (%)

100

Examination (%)

0

Assessment Rubrics (AR)**Assessment Task**

Assignment (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Answer simple questions related to concepts introduced in the class and perform data analysis using Python to solve real marketing problems.

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

In-Class Midterm (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

The midterm test is designed to assess students' understanding of models and their ability to frame marketing problems within a data analysis framework.

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

Project (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Students are required to work with real business data, applying concepts and models learned in the class to analyze the data and make informed business decisions. Proficiency in Python programming is essential.

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

Assignment (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Answer simple questions related to concepts introduced in the class and perform data analysis using Python to solve real marketing problems.

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Moderate

Failure

(F) Fail to understand the core concepts

Assessment Task

In-Class Midterm (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

The midterm test is designed to assess students' understanding of models and their ability to frame marketing problems within a data analysis framework.

Excellent

(A+, A, A-) High

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Project (for students admitted from Semester A 2022/23 to Summer Term 2024)

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Students are required to work with real business data, applying concepts and models learned in the class to analyze the data and make informed business decisions. Proficiency in Python programming is essential.

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(B-, C+, C) Moderate

Failure

(F) Fail to understand the core concepts

Part III Other Information

Keyword Syllabus

- Machine learning and statistical models, including linear regression, logistic regression, clustering. Concepts of random experiment, oversampling, data training and validation, etc.
- Analyze different types of data, including time series, cross section and panel data.
- Marketing models, including estimating demand, elasticity, pricing, lift, ROI, odd-ratio, customer lifetime value.
- Other interesting marketing applications, including digital marketing, customer relation management, recommender systems, promotions and advertisement.

Reading List

Compulsory Readings

Title	
1	Nil

Additional Readings

Title	
1	James, Gareth, Daniela Witten, Trevor Hastie, and Robert Tibshirani. An introduction to statistical learning: with Applications in R. Springer, 2017. (This is a good book about machine learning algorithms, examples are demonstrated in R.)
2	Müller, Andreas C., and Sarah Guido. Introduction to machine learning with Python: a guide for data scientists. "O'Reilly Media, Inc.", 2016. (This is a good book about machine learning with Python.)
3	Rossi, Peter E., Greg M. Allenby, and Rob McCulloch. Bayesian statistics and marketing. John Wiley & Sons, 2012. (This book covers some concepts of quant marketing and Bayesian statistics.)