Universitat Pompeu Fabra Barcelona

Academic Year: 2025/26

22962 - Computational Marketing

Teaching Guide Information

Academic Course: 2025/26

Academic Center: 304 - Faculty of Law and Economics
332 - Faculty of Economic and Business Sciences

Study: 3327 - Bachelor's degree in International Business Economics

Subject: 22962 - Computational Marketing

Credits: 5.0

Course: 3 and 4

Teaching languages:

Theory:	Group 1: English
Seminar:	Group 101: Pending
	Group 102: Pending

Teachers: Mohammad Ghaderi

Teaching Period: Third term

Presentation

The integration of transformative technologies and the exponential growth of data are driving a profound shift in the business landscape. Marketing strategies are being revolutionized to leverage data for a deeper understanding of customers to inform marketing decisions. This course offers an overview of the tools and techniques in computational marketing, exploring the key concepts, appropriate implementations, and the opportunities they offer. Through a blend of theory and hands-on applications, you will gain the skills to effectively utilize data analytics, enabling you to make informed marketing decisions, optimize campaigns, and unlock untapped potential for growth and innovation in competitive markets.

Associated skills | General learning outcomes

General Skills

Instrumentals

1. Ability to analyze and synthesize
2. Ability to organize and plan
3. General basic mathematical knowledge: probability theory and statistics, calculus and basic algebra
4. Problem solving
5. Written and spoken capabilities

Interpersonal

6. Criticism

Systemic

7. Research abilities
8. Learning capacities
9. Autonomous work
10. Ability to generate new ideas (creativity)

Other

11. Written and oral communication abilities using a specialized language (online marketing).

Learning outcomes | Specific learning outcomes

- effectively utilize data analytics,
- make informed marketing decisions,
- optimize campaigns and marketing mix variables,
- unlock untapped potential for growth and innovation in competitive markets

Contents

1. Stepping Stones
    - Anatomy of Regression
    - Review of Probability Theory, Conditional Probability, Bayes Theorem, Independence
    - Measurement
    - Data Summarization and Visualization (--> Getting Started with R!)
    - Hypothesis Testing
2. Market Outcome Drivers
    - Building a Regression Model
        - Case: Amusement Park Customer Satisfaction
        - Case: Starting Salary
    - Predictions and Counterfactuals
        - Case: Cardio Machine
    - Confounders, Selection, Collinearity
    - Interaction and Nonlinearity
    - Bayesian Regression
3. Classification
    - Logit Model
    - Theoretical Underpinnings
    - Estimating Logit Models
        - Case: Ski Resort
    - Validating Logit Models
    - Practical Issues
    - Random Trees & Random Forests
    - More Classifiers

4. Market Segmentation
    - Segmentation: Why and How?
    - Hierarchical Clustering
        - Case: Subscription-based service
    - Profiling
    - Identification
    - Practical Issues
    - K-means Clustering
    - Robustness Analysis

References:

- Lecture notes & Selected articles
- For theoretical concepts: J. Hair et al, Multivariate Data Analysis 8th ed., (2018)
- For R implementation and computational issues: Chapman & McDonnell Feit, R for Marketing Research and Analytics (2019)

Evaluation and grading system

Active Participation & Quizzes 15%

Homework 15%

Midterm 30%

Final Exam 40%

Make-up Exam: If you get a final grade below 5.0, it is considered a failure, and you will have to take a make-up exam. Your score in the make-up exam will replace that of your final exam.